Urine Preservative and Transport List

Urine Preservative and Transport List

Test Name	Collection Time	Aliquot	Transport Temperature	Preservative	Comments
17-Hydroxycorticosteriods	Random or *24-hour	Three 4 mL aliquots	Frozen	None if frozen. Also acceptable pH adjusted to 5-7 with boric acid. Add 1 g boric acid/100 mL urine.	Refrigerate 24-hour specimen during collection.
17-Hydroxyprogesterone, Urine	*24-hour	5 mL	Frozen	None	Refrigerate 24-hour specimen during collection.
17-Ketosteroids, Urine	*24-hour	4 mL	Refrigerated	Preservation enhanced by adjusting pH to 2-4 with 6M HCl.	Refrigerate 24-hour specimen during collection.
2,4-Dichlorophenoxyacetic Acid, Urine	Random	4 mL	Room Temperature	None	Refrigerated and frozen samples are also acceptable.
5-Hydroxyindoleacetic Acid (HIAA), Urine	Random or *24-hour	4 mL	Refrigerated	None	Refrigerate 24-hour specimen during collection.
Acylglycines, Quantitative, Urine	Random	6 mL	Frozen	None	Clinical information is needed for appropriate interpretation: complete Biochemical Genetics Patient History Form and submit with specimen.
Aldosterone, Urine	*24-hour	4 mL	Frozen	Add 1 g boric acid/100 mL urine.	Refrigerate 24-hour specimen during collection. Specimen without preservative is acceptable if frozen immediately after collection.
Alpha-1-Microglobulin, Urine	*24-hour	4 mL	Refrigerated	None	Refrigerate 24-hour specimen during collection.
Aluminum, Urine	Random or *24-hour	Two 4 mL aliquots	Refrigerated	**None if tested within 14 days of collection.	Collect in plastic container. Refrigerate 24-hour specimen during collection. Submit specimen in two ARUP Trace Element-Free Transport Tubes (supply #43116).
Amino Acids Quantitative, Urine	First-morning void	Two 4 mL aliquots	Critical Frozen	None	Clinical information is needed for appropriate interpretation: complete Biochemical Genetics Patient History Form and submit with specimen.
Aminolevulinic Acid (ALA), Urine	Random or *24-hour	4 mL aliquot in amber tube	Refrigerated	None	Refrigerate 24-hour specimen during collection. Protect from strong light. Submit specimen in an ARUP Amber Transport Tube (supply #13654).
Amylase, Urine	*24-hour or timed	4 mL	Refrigerated	Adjust pH to ≥6 by adding 5% NaOH	Refrigerate 24-hour specimen during collection.
Anabolic Steroids Panel	Random	40 mL	Refrigerated	None	

Urine Preservative and Transport List

Test Name	Collection Time	Aliquot	Transport Temperature	Preservative	Comments
Antimony, Urine	Random or *24-hour	Two 4 mL aliquots	Refrigerated	**None if tested within 14 days of collection.	Collect in plastic container. Refrigerate 24-hour specimen during collection. Submit specimen in two ARUP Trace Element-Free Transport Tubes (supply #43116).
Aromatic Primary Amines, Urine	End of shift	2 mL	Room Temperature	None	Collect sample at end of shift at the end of work week.
Arsenic, Fractionated, Urine	Random or *24-hour	10 mL	Refrigerated	**None if tested within 14 days of collection.	Collect in plastic container. Refrigerate 24-hour specimen during collection. Submit specimen in ARUP Trace Element-Free Transport Tubes (supply #43116).
Arsenic, Urine with Reflex to Fractionated	Random or *24-hour	Two 4 mL aliquots	Refrigerated	**None if tested within 14 days of collection.	Collect in plastic container. Refrigerate 24-hour specimen during collection. Submit specimen in two ARUP Trace Element-Free Transport Tubes (supply #43116).
Arylsulfatase A, Urine	*24-hour	10 mL	Refrigerated	None	
Bence Jones Protein Detection, Quantitation and Characterization with Reflex to Quantitative Free Kappa and Lambda Light Chains, Urine	*24-hour	Two 4 mL aliquots	Refrigerated	None	Refrigerate 24-hour specimen during collection.
Bence Jones Protein, Qualitative Free Kappa & Lambda Light Chains, Urine	Random or *24-hour	Two 4 mL aliquots	Refrigerated	None	Refrigerate 24-hour specimen during collection.
Bence Jones Protein, Quantitative Free Kappa & Lambda Light Chains, Urine	Random or *24-hour	Two 4 mL aliquots	Refrigerated	None	Refrigerate 24-hour specimen during collection.
Bence Jones Protein, Quantitative Free Kappa Light Chains, Urine	*24-hour	Two 4 mL aliquots	Refrigerated	None	Refrigerate 24-hour specimen during collection.
Bence Jones Protein, Quantitative Free Lambda Light Chains, Urine	*24-hour	Two 4 mL aliquots	Refrigerated	None	Refrigerate 24-hour specimen during collection.
Beryllium, Urine	End of shift	3 mL	Refrigerated	None	Collect in a trace metal-free or acid-washed plastic container. Submit specimen in an ARUP Trace Element-Free Transport Tube (supply #43116).
Beta-2 Microglobulin, Urine	Random	3 mL	Frozen	If pH is > 8, lower pH to 6-8 by adding 1M HCL. If pH < 6, increase pH to 6-8 by adding 5% NaOH.	Record the pH on the transport tube and test request form.

Urine Preservative and Transport List

Test Name	Collection Time	Aliquot	Transport Temperature	Preservative	Comments
Bicarbonate (HCO3), Urine	Random	4 mL	Critical Frozen	None	Random urine in sealed container. Mix immediately upon collection and remove aliquot. Do not expose to air.
Bismuth, Urine	Random or *24-hour	Two 4 mL aliquots	Refrigerated	**None if tested within 14 days of collection.	Collect in plastic container. Refrigerate 24-hour specimen during collection. Submit specimen in two ARUP Trace Element-Free Transport Tubes (supply #43116).
BK Virus, Quantitative PCR, Urine	Random	1 mL	Frozen	None	Critical Sterile.
Bladder Tumor Associated Antigen	Random	2 mL	Refrigerated	None	
Blastomyces dermatitidis Antigen EIA	Random	2 mL	Refrigerated	None	
Boron, Urine	Random	Two 4 mL aliquots	Refrigerated	None	Collect urine in a trace metal-free or acid-washed plastic. Submit specimen in an ARUP Trace Element-Free Transport Tube (supply #43116).
Bretylium, Urine	Random	2 mL	Ambient	None	
Cadmium, Urine	Random or *24-hour	Two 4 mL aliquots	Refrigerated	**None if tested within 14 days of collection.	Collect in plastic container. Refrigerate 24-hour specimen during collection. Submit specimen in two ARUP Trace Element-Free Transport Tubes (supply #43116).
Cadmium Exposure Panel - OSHA	Beginning of work shift	**β-2-Microglb.** 2 mL **Cadmium** Two 4 mL aliquots in Trace Element-Free tubes **Creatin.** 3 mL.	Frozen and Refrigerated	**β-2-Microglobulin aliquot:** Adjust pH to 6-8 with 1M HCl or 5% NaOH. Freeze immediately. **Cadmium aliquot:** Add 0.1 mL of 12M HNO_3 to aliquot. Ship refrigerated. **Creatinine aliquot:** No pH adjustment. Ship refrigerated.	To avoid contamination, collect specimens at the beginning of work shift. Blood and urine should be collected the same day. Label each aliquot with approriate test name.
Calcium, Urine	Random or *24-hour	3 mL	Refrigerated	Adjust pH to 1.5-2 by adding 6M HCl.	Refrigerate 24-hour specimen during collection.

Urine Preservative and Transport List

Test Name	Collection Time	Aliquot	Transport Temperature	Preservative	Comments
Carnitine, Free & Total, Urine	Random	5 mL	Critical Frozen	None	Freeze specimen immediately.
Carnitine, Free, Urine	Random	5 mL	Critical Frozen	None	Freeze specimen immediately.
Carnitine, Total, Urine	Random	5 mL	Critical Frozen	None	Freeze specimen immediately.
Catecholamines Fractionated by LC-MS/MS, Urine Free	Random or *24-hour	4 mL	Refrigerated	Preservation enhanced by adjusting pH to 2-3 with 6M HCl.	Refrigerate 24-hour specimen during collection.
Chlamydia trachomatis & Neisseria gonorrhoeae by Amplified Detection (APTIMA®)	Random	2 mL minimum	Refrigerated	None	Collect in APTIMA® Combo 2 Assay transport media (supply #28908).
Chlamydia trachomatis by Amplified Detection (APTIMA®)	Random	2 mL	Refrigerated	None	Collect in APTIMA® Combo 2 Assay transport media (supply #28908).
Chloride, Urine	Random or *24-hour	1 mL	Refrigerated	None	Refrigerate 24-hour specimen during collection.
Chromium, Urine	Random or *24-hour	Two 4 mL aliquots	Refrigerated	**None if tested within 14 days of collection.	Collect in plastic container. Refrigerate 24-hour specimen during collection. Submit specimen in two ARUP Trace Element-Free Transport Tubes (supply #43116).
Citric Acid, Urine	Random or *24-hour	4 mL	Refrigerated	Adjust pH to ≤ 2 by adding 6M HCl.	Refrigerate 24-hour specimen during collection.
Cobalt, Urine	Random or *24-hour	Two 4 mL aliquots	Refrigerated	**None if tested within 14 days of collection.	Collect in plastic container. Refrigerate 24-hour specimen during collection. Submit specimen in two ARUP Trace Element-Free Transport Tubes (supply #43116).
Copper, Urine	Random or *24-hour	Two 4 mL aliquots	Refrigerated	**None if tested within 14 days of collection.	Collect in plastic container. Refrigerate 24-hour specimen during collection. Submit specimen in two ARUP Trace Element-Free Transport Tubes (supply #43116).
Cortisol Urine Free by LC-MS/MS	Random or *24-hour	4 mL	Refrigerated	None	Refrigerate 24-hour specimen during collection.
Cortisol/Cortisone Urine Free by LC-MS/MS	Random or *24-hour	4 mL	Refrigerated	None	Refrigerate 24-hour specimen during collection.
C-Peptide, 24-Hour Urine	Random or *24-hour	2 mL	Frozen	None	Refrigerate 24-hour specimen during collection.
Creatine, Urine	Random	2 mL	Frozen	None	Freeze urine as soon as possible after collection.

Urine Preservative and Transport List

Test Name	Collection Time	Aliquot	Transport Temperature	Preservative	Comments
Creatine Disorders Panel, Urine	Random or timed	2 mL	Frozen	None	Freeze urine as soon as possible after collection. Clinical information is needed for appropriate interpretation: complete Biochemical Genetics Patient History Form and submit with specimen.
Creatinine Clearance, Urine	*24-hour	3 mL	Refrigerated	None	Refrigerate 24-hour specimen during collection. 1 mL plasma or serum, refrigerated is also required.
Creatinine, 24-Hour Urine	Random or *24-hour	3 mL	Refrigerated	None	Refrigerate 24-hour specimen during collection.
Cyclic AMP, Nephrogenous	Random or timed	5 mL	Frozen	None	1 mL plasma, frozen is also required. Separate plasma from cells and freeze ASAP.
Cyclic AMP, Urine	Random preferred or *24-hour	5 mL	Frozen	None	Collect in container with 10 mL 6M HCl. Refrigerate 24-hour specimen during collection.
Cystine Quantitative, Urine	Timed or *24-hour	Two 4 mL aliquots	Critical Frozen	None	Refrigerate timed specimen during collection. Freeze urine as soon as possible after collection. Clinical information is needed for appropriate interpretation: complete Biochemical Genetics Patient History Form and submit with specimen.
Cystinuria Panel	Random	Two 4 mL aliquots	Critical Frozen	None	Freeze urine as soon as possible after collection. Clinical information is needed for appropriate interpretation: complete Biochemical Genetics Patient History Form and submit with specimen.
Deoxypyridinoline Crosslinks	First morning void	3.5 mL	Frozen	None	
Diuretic Survey, Urine	Random	10 mL	Room Temperature	None	
Drugs of Abuse Panel, Urine - Screen Only	Random	4 mL	Refrigerated	None	Multiple tests available. Refer to the test directory at www.aruplab.com
Drugs of Abuse Panel, Urine - Screen with Reflex to Confirmation/Quantitation	Random	Two 4 mL aliquots	Refrigerated	None	
Drugs of Abuse Confirmation/Quantitation, Urine	Random	4 mL	Room Temperature	None	
Ehlers-Danlos Syndrome Type VI Screen	First morning void	4 mL	Frozen	None	Random specimens are also acceptable.
Electrolytes, Urine	Random or *24-hour	1 mL	Refrigerated	None	Refrigerate 24-hour specimen during collection.
Estronex™ Profile	First morning void	13 mL	Critical Frozen	None	Submit specimen in Estronex Tube (supply #40478).

Urine Preservative and Transport List

Test Name	Collection Time	Aliquot	Transport Temperature	Preservative	Comments
Fat, Urine Qualitative	Random	5 mL	Refrigerated	None	
Fluoride, Urine	Random	6 mL	Refrigerated	None	Collect sample in a trace metal-free or acid-washed plastic container.
Formic Acid, Urine	Random	5 mL	Room Temperature	None	Collect urine prior to the last shift of the work week.
Gamma-Hydroxybutyric Acid, Urine	Random	5 mL	Refrigerated	None	
Glucose, Urine	Random or *24-hour	4 mL	Refrigerated	None	Refrigerate 24-hour specimen during collection.
Glutarylcarnitine Quantitative, Urine	Random	2.5 mL	Critical Frozen	None	Freeze urine immediately after collection. Clinical information is needed for appropriate interpretation: complete Biochemical Genetics Patient History Form and submit with specimen.
Gold, Urine	Random	1.0 mL	Refrigerated	None	Collect sample in a trace metal-free or acid-washed plastic container.
Heavy Metals Panel 3, Urine with Reflex to Arsenic Fractionated	Random or *24-hour	Two 4 mL aliquots	Refrigerated	**None if tested within 14 days of collection.	Collect in plastic container. Refrigerate 24-hour specimen during collection. Submit specimen in two ARUP Trace Element-Free Transport Tubes (supply #43116).
Heavy Metals Panel 4, Urine with Reflex to Arsenic Fractionated	Random or *24-hour	Two 4 mL aliquots	Refrigerated	**None if tested within 14 days of collection.	Collect in plastic container. Refrigerate 24-hour specimen during collection. Submit specimen in two ARUP Trace Element-Free Transport Tubes (supply #43116).
Heavy Metals Panel 6, Urine with Reflex to Arsenic Fractionated	Random or *24-hour	Two 4 mL aliquots	Refrigerated	**None if tested within 14 days of collection.	Collect in plastic container. Refrigerate 24-hour specimen during collection. Submit specimen in two ARUP Trace Element-Free Transport Tubes (supply #43116).
Hemoglobin, Urine	Random	4 mL	Frozen	None	Centrifuge sample. Send urine free from cells and sediment.
Hemosiderin, Urine	First morning void	4.5 mL	Frozen	None	Random specimens are also acceptable.
Hippuric Acid, Urine	End of shift	2 mL	Refrigerated	None	
Histamine, Urine	Random or *24-hour	4 mL	Critical Frozen	None	Collect in plastic container. Refrigerate 24-hour specimen during collection.
Histoplasma Antigen by EIA, Urine	Random	2 mL	Refrigerated	None	Submit specimen according to Biological Substance, Category B, shipping guidelines.
Homocystine Quantitative, Urine	Random or *24-hour	5 mL	Frozen	None	Refrigerate 24-hour specimen during collection.

Urine Preservative and Transport List

Test Name	Collection Time	Aliquot	Transport Temperature	Preservative	Comments
Homovanillic Acid (HVA), Urine	Random or *24-hour	4 mL	Refrigerated	None	Refrigerate 24-hour specimen during collection.
Hydroxyproline, Total Urine	*24-hour	5 mL	Frozen	None	Refrigerate 24-hour specimen during collection.
Indicans, Urine Qualitative	Random	Two 4 mL aliquots	Frozen	None	
Iodine, 24 Hour, Urine	*24-hour	10 mL	Refrigerated	None	Collect in plastic container with no metal cap or glued insert.
Iodine, Random, Urine	Random	2 mL	Refrigerated	None	Collect in plastic container with no metal cap or glued insert.
Iron, Random Urine	Random	2 mL	Refrigerated	None	Collect in plastic container.
Iron, 24-Hour Urine	*24-hour	10 mL	Refrigerated	None	Collect in plastic container with no metal cap or glued insert. Refrigerate 24-hour specimen during collection.
Kidney Stone Risk Panel, Urine	*24-hour, 4 separate aliquots	Four 4 mL aliquots.	Frozen	**1st aliquot:** Dispense 4 mL of specimen into the Sulfamic Acid Tube. Mix well, then freeze. **2nd aliquot:** Dispense 4 mL of specimen into the Sodium Carbonate Tube. Mix well, then freeze. **3rd aliquot:** Dispense 4 mL of specimen into an Unpreserved Tube. Mix well, then freeze. **4th aliquot:** Dispense 4 mL of specimen into an Unpreserved Tube. Mix well, then freeze.	Refrigerate 24-hour specimen during collection. Use Kidney Stone/Supersaturation Urine Collection Kit (ARUP supply# 46007).

Urine Preservative and Transport List

Test Name	Collection Time	Aliquot	Transport Temperature	Preservative	Comments
Kidney Stone Risk Panel II, Urine	*24-hour, 4 separate aliquots	Four 4 mL aliquots.	Frozen	**1st aliquot:** Dispense 4 mL of specimen into the Sulfamic Acid Tube. Mix well, then freeze. **2nd aliquot:** Dispense 4 mL of specimen into the Sodium Carbonate Tube. Mix well, then freeze. **3rd aliquot:** Dispense 4 mL of specimen into an Unpreserved Tube. Mix well, then freeze. **4th aliquot:** Dispense 4 mL of specimen into an Unpreserved Tube. Mix well, then freeze.	Refrigerate 24-hour specimen during collection. Use Kidney Stone/Supersaturation Urine Collection Kit (ARUP supply# 46007).
Lead, Urine	Random or *24-hour	Two 4 mL aliquots	Refrigerated	**None if tested within 14 days of collection.	Collect in plastic container. Refrigerate 24-hour specimen during collection. Submit specimen in two ARUP Trace Element-Free Transport Tubes (supply #43116).
Legionella pneumophila Antigen, Urine	Random	4 mL	Refrigerated		
Lipase, Urine	Timed or *24-hour	10 mL	Refrigerated	If pH is <6, adjust pH to 6 by adding 5% NaOH (approximately 2 mL per liter). Mix well. Amylase is not stable in acidified samples (pH < 6) and decreases of up to 30% may occur.	Refrigerate specimen during collection.
Lysozyme, Urine	Random	3 mL	Refrigerated	None	

Urine Preservative and Transport List

Test Name	Collection Time	Aliquot	Transport Temperature	Preservative	Comments
Magnesium, Urine	Random or *24-hour	4 mL	Refrigerated	Adjust pH to 1 by adding 6M HCl.	Refrigerate 24-hour specimen during collection.
Manganese, Urine	Random or *24-hour	Two 4 mL aliquots	Refrigerated	**None if tested within 14 days of collection.	Collect in plastic container. Refrigerate 24-hour specimen during collection. Submit specimen in two ARUP Trace Element-Free Transport Tubes (supply #43116).
Melanin, Urine	Random	4.5 mL in amber tube.	Critical Frozen	None	Protect from strong light. Submit specimen in an ARUP Amber Transport Tube (supply #13654).
Mercury, Urine	Random or *24-hour	Two 4 mL aliquots	Refrigerated	**None if tested within 14 days of collection.	Collect in plastic container. Refrigerate 24-hour specimen during collection. Submit specimen in two ARUP Trace Element-Free Transport Tubes (supply #43116).
Metanephrines, Urine	Random or *24-hour	4 mL	Refrigerated	Preservation enhanced by adjusting pH to 2-3 with 6M HCl.	Refrigerate 24-hour specimen during collection.
Methylhippuric Acid, Urine	End of shift.	4 mL	Room Temperature	None	
Methylmalonic Acid (MMA) Quantitation, Urine	Random or *24-hour	4 mL	Frozen	None	Refrigerate 24-hour specimen during collection.
Microalbumin, Urine	Random, timed or *24-hour	1 mL	Refrigerated	None	Refrigerate 24-hour specimen during collection.
Mucopolysaccharides Screen - Electrophoresis & Quantitation, Urine	Morning void preferred.	20 mL	Frozen	None	Freeze specimen immediately.
Mucopolysaccharides, Quantitative, Urine	Morning void preferred.	10 mL	Frozen	None	Freeze specimen immediately.
Myoglobin Clearance	4 to *24-hour urine collection.	1 mL	Frozen	Adjust pH to 8-9 by adding 10% Na2CO3.	1 mL serum frozen is also required.
Myoglobin, Urine	Random or *24-hour	1 mL	Refrigerated	Adjust pH to 8-9 by adding 10% Na2CO3.	Refrigerate 24-hour specimen during collection.
Neisseria gonorrhoeae by Amplified Detection (APTIMA®)	Random	2 mL	Refrigerated	None	Collect in APTIMA® Combo 2 Assay transport media. (supply #28908).
Nickel, Urine	Random or *24-hour	Two 4 mL aliquots	Refrigerated	**None if tested within 14 days of collection.	Collect in plastic container. Refrigerate 24-hour specimen during collection. Submit specimen in two ARUP Trace Element-Free Transport Tubes (supply #43116).
Nitrogen, Total, Urine	*24-hour required	10 mL	Refrigerated	None	Refrigerate 24-hour specimen during collection.

Urine Preservative and Transport List

Test Name	Collection Time	Aliquot	Transport Temperature	Preservative	Comments
NMP22®	Single void between midnight and noon	5 mL stabilized urine	Frozen	Add urine immediately to NMP22® Urine Stabilizer Vial. ARUP supply #12594.	Stabilized specimen should be blue/green in color.
N-Telopeptide, Cross-Linked, Urine	*24-hour or second-morning void	1 mL	Frozen	None	Refrigerate 24-hour specimen during collection.
Organic Acids, Urine	Random	10 mL	Critical Frozen	None	Freeze specimen immediately. Clinical information is needed for appropriate interpretation: complete Biochemical Genetics Patient History Form and submit with specimen.
Orotic Acid and Orotidine, Urine	First-morning void preferred or random	2 mL	Critical Frozen	None	Freeze specimen immediately.
Oxalate, Urine	*24-hour	4 mL	Refrigerated	Adjust pH to 1.5-2 by adding 6M HCl	Refrigerate 24-hour specimen during collection.
PCA3 - Prostate Cancer Biomarker	Random urine according to PCA3 specimen collection instructions	Two 2 mL aliquots	Frozen	None	Order PCA3 kit online through eSupply or ARUP Client Services at (800) 522-2787 (supply #45682). **Ship Monday-Wednesday only.**
Phenol Exposure, Urine	End of work shift.	4 mL	Refrigerated	None	Preservative-free urine specimens are recommended.
Phosphorus, Urine	Random or *24-hour	3 mL	Frozen	Adjust pH to 1.5-2 by adding 6M HCl	Refrigerate 24-hour specimen during collection.
Porphobilinogen (PBG), Urine	Random or *24-hour	Two 4 mL aliquots in amber tube	Frozen	None	Refrigerate 24-hour specimen during collection. Protect from strong light. Submit specimen in two ARUP Amber Transport Tubes (supply #13654).
Porphyrins & Porphobilinogen (PBG), Urine	Random or *24-hour	Two 4 mL aliquots in amber tube	Frozen	None	Refrigerate 24-hour specimen during collection. Protect from strong light. Submit specimen in two ARUP Amber Transport Tubes (supply #13654).
Porphyrins, Fractionation & Quantitation, Urine	Random or *24-hour	4 mL in amber tube	Frozen	None	Refrigerate 24-hour specimen during collection. Protect from strong light. Submit specimen in an ARUP Amber Transport Tube (supply #13654).
Potassium, Urine	Random or *24-hour	1 mL	Refrigerated	None	Refrigerate 24-hour specimen during collection.
Protein, Total, Urine	Random or *24-hour	4 mL	Refrigerated	None	Refrigerate 24-hour specimen during collection.

Urine Preservative and Transport List

Test Name	Collection Time	Aliquot	Transport Temperature	Preservative	Comments
Pyridinium Crosslinks (Total)	First Morning void.	3.5 mL	Frozen	None	
Pyridinoline & Deoxypyridinoline by HPLC	First Morning void.	Two 4 mL aliquots	Frozen	None	
Selenium, Urine	Random or *24-hour	Two 4 mL aliquots	Refrigerated	**None if tested within 14 days of collection.	Collect in plastic container. Refrigerate 24-hour specimen during collection. Submit specimen in two ARUP Trace Element-Free Transport Tubes (supply #43116).
Silicon, Urine	Random	6 mL	Refrigerated	None	Collect in a trace metal-free or acid-washed container.
Silver, Urine	Random	1 mL in foil-wrapped Trace Element-Free Transport Tube	Refrigerated	None	Collect in a trace metal-free container. Protect from strong light. Submit specimen in a foil-wrapped ARUP Trace Element-Free Transport Tube (supply #43116).
Sodium, Urine	Random or *24-hour	1 mL	Refrigerated	None	Refrigerate 24-hour specimen during collection.
Streptococcus pneumoniae Antigen, Urine	Random	4 mL	Refrigerated	None	Submit specimen according to Biological Substance, Category B, shipping guidelines.
Sulfate, Urine	*24-hour	4 mL	Critical Frozen	None	Refrigerate 24-hour specimen during collection.
Sulfonylurea Hypoglycemics Panel (Quantitative), Urine	Random	5 mL	Refrigerated	None	
Tellurium, Urine	Random or *24-hour	Two 4 mL aliquots	Refrigerated	**None if tested within 14 days of collection.	Collect in plastic container. Refrigerate 24-hour specimen during collection. Submit specimen in two ARUP Trace Element-Free Transport Tubes (supply #43116).
Testosterone, Urine	*24-hour	5 mL	Critical Frozen	None	Refrigerate 24-hour specimen during collection.
Thallium, Urine	Random or *24-hour	Two 4 mL aliquots	Refrigerated	**None if tested within 14 days of collection.	Collect in plastic container. Refrigerate 24-hour specimen during collection. Submit specimen in two ARUP Trace Element-Free Transport Tubes (supply #43116).
Tin Total, Urine	Random	4 mL	Room Temperature	None	Collect urine in trace metal-free or acid-washed plastic container.
Titanium, Urine	Random	1 mL	Refrigerated	None	Collect urine in trace metal-free or acid-washed plastic container.
Urea Nitrogen, Urine	Random or *24-hour	3 mL	Refrigerated	None	Refrigerate 24-hour specimen during collection.
Uric Acid, Urine	Random or *24-hour	3 mL	Refrigerated	Adjust pH to >8 by adding 5% NaOH.	Refrigerate 24-hour specimen during collection.

Urine Preservative and Transport List

Test Name	Collection Time	Aliquot	Transport Temperature	Preservative	Comments
Urine Supersaturation Profile	*24-hour	Four 4 mL aliquots.	Frozen	**1st aliquot:** Dispense 4 mL of specimen into the Sulfamic Acid Tube. Mix well, then freeze. **2nd aliquot:** Dispense 4 mL of specimen into the Sodium Carbonate Tube. Mix well, then freeze. **3rd aliquot:** Dispense 4 mL of specimen into an Unpreserved Tube. Mix well, then freeze. **4th aliquot:** Dispense 4 mL of specimen into an Unpreserved Tube. Mix well, then freeze.	Refrigerate 24-hour specimen during collection. Use Kidney Stone/Supersaturation Urine Collection Kit (ARUP supply# 46007).
UroVysion™ FISH	Second-morning, clean-catch void	35 mL	Refrigerated	Mix voided urine 2:1 with Saccomanno or PreservCyt® fixative and transfer to a screw-top transport tube.	UroVysion™ FISH Collection Kits fixative can be ordered through ARUP Client Services (supply #41440). Clinical information is needed for appropriate interpretation: complete Cytology Request Form and submit with specimen.
Vanadium Quantitation, Urine	End of last shift at the end of the work week	3 mL	Refrigerated	None	Collect in a trace metal-free or acid-washed container.
Vanillylmandelic Acid (VMA) & Homovanillic Acid (HVA), Urine	Random or *24-hour	4 mL	Refrigerated	None	Refrigerate 24-hour specimen during collection.
Vanillylmandelic Acid (VMA), Urine	Random or *24-hour	4 mL	Refrigerated	None	Refrigerate 24-hour specimen during collection.
Warfarin, Urine	Random	2 mL	Room Temperature	None	
Zinc, Urine	Random or *24-hour	Two 4 mL aliquots	Refrigerated	**None if tested within 14 days of collection.	Collect in plastic container. Refrigerate 24-hour specimen during collection. Submit specimen in two ARUP Trace Element-Free Transport Tubes (supply #43116).

Laboratories Critical Values / Critical Results List

Laboratories Critical Values / Critical Results List

PURPOSE
The purpose of this list is to identify the laboratory tests and their respective critical high and critical low values/results.

DEFINITION
A Critical Value / Critical Result is defined as
A value/result that represents a pathophysiological state at such variance with normal (expected values) as to be life-threatening unless something is done promptly and for which some corrective action could be taken.

NOTE: The critical values/results do not necessarily correspond directly with normal reference ranges, toxic ranges, or therapeutic ranges.

HEMATOLOGY

Test Report Name	Age	Critical Low	Critical High	Units
Activated Partial Thromboplastin Time, Plasma		-	≥ 150	sec
Fibrinogen		≤ 60	-	mg/dL
Hemoglobin	0-7 weeks	≤ 6.0	≥ 24.0	g/dL
Hemoglobin	> 7 weeks	≤ 6.0	≥ 20.0	g/dL
INR (International Normalizing Ratio)		-	≥ 5.0	
Leukocytes		-	≥ 100.0	x10(9)/L
Absolute Neutrophil Count		≤ 0.5	-	x10(9)/L
Neutrophils		≤ 0.5	-	x10(9)/L
Platelets, Blood		≤ 40	≥ 1000	x10(9)/L
CSF White Blood Cell Count			≥ 100.0	Cells/mcL

References: Mayo clinic Laboratories

CHEMISTRY

Test Report Name	Age	Critical Low	Critical High	Units
Ammonia – (Florida units are µmol/L, MCHS&RST units are mcmol/L)	≥ 1 yr	-	≥ 200	mcmol/L
*Ammonia – Arizona (Deviation in units)	≥ 1 yr		≥ 500	mcg/dL
Ammonia – (Florida units are µmol/L, MCHS&RST units are mcmol/L)	< 1 yr	-	≥ 100	mcmol/L
*Ammonia – Arizona (Deviation in units)	< 1 yr		≥ 150	mcg/dL
Bilirubin Total, Serum	< 1 yr	-	≥ 15.0	mg/dL
Calcium, Total		≤ 6.5	≥ 13.0	mg/dL
Calcium, Ionized, Blood	< 1 yr	≤ 2.0	≥ 6.0	mg/dL
Calcium, Ionized, Blood	≥ 1 yr	≤ 3.0	≥ 6.5	mg/dL
*Calcium, Ionized, Blood - Florida (Deviation due to methodology difference)	< 1yr	≤ 3.0	≥ 5.5	mg/dL
*Calcium, Ionized, Blood - Florida (Deviation due to methodology difference)	≥ 1 yr	≤ 3.0	≥ 6.0	mg/dL
Carbon Monoxide (Carboxyhemoglobin Level)		-	≥ 20	%
Creatinine, Blood/Plasma/Serum	1 day-4 weeks	-	≥ 1.5	mg/dL
Creatinine, Blood/Plasma/Serum	5 weeks-23 mos	-	≥ 2.0	mg/dL
Creatinine, Blood/Plasma/Serum	2 yrs-11 yrs	-	≥ 2.5	mg/dL
Creatinine, Blood/Plasma/Serum	12 yrs-15 yrs	-	≥ 3.0	mg/dL
Creatinine, Blood/Plasma/Serum	≥ 16 yrs	-	≥ 10.0	mg/dL
Creatine Kinase, Total		-	≥ 10,000	U/L
FT4 (Free Thyroxine)	< 50 yrs	-	≥ 7.8	ng/dL
FT4 (Free Thyroxine)	≥ 50 yrs	-	≥ 6.0	ng/dL
FT4 (Free Thyroxine) – Florida	All ages	-	≥ 7.8	ng/dL
Glucose, Plasma/Serum	< 4 weeks	≤ 40	≥ 400	mg/dL
Glucose, Plasma/Serum	≥ 4 weeks	≤ 50	≥ 400	mg/dL
Magnesium, Serum		≤ 1.0	≥ 9.0	mg/dL
Osmolality		≤ 190	≥ 390	mOsm/Kg
*pH (MCHS and AZ only)		≤ 7.200	≥ 7.600	pH
*pC02, arterial (MCHS and AZ only)		≤ 20.0	≥ 70.0	mmHg
*pO2 (MCHS)		≤ 40.0	-	mmHg
*pO2 (AZ)		≤ 45.0	-	mmHg
Phosphorus		≤ 1.0	-	mg/dL
Potassium		≤ 2.5	≥ 6.0	mmol/L
Sodium		≤ 120	≥ 160	mmol/L

TOXICOLOGY/TDM

Test Report Name	Age	Critical Low	Critical High	Units
Acetaminophen, S		-	> 150 4 hours after dose	mcg/mL
Acetone (Volatile Screen), applies to all specimen types		-	Any value detected	mg/dL
Amitriptyline and Nortriptyline, S		-	> 500	ng/mL
Butalbital, S		-	≥ 10	mcg/mL
Caffeine, S		-	≥ 30	mcg/mL
Carbamazepine, Total, S		-	≥ 15.0	mcg/mL
Carbamazepine, Free, S		-	≥ 4.0	mcg/mL
Clomipramine + Norclomipramine, S			> 450	ng/mL
Cyanide, B		-	≥ 2.0	mcg/mL
Desipramine, S		-	>400	ng/mL
Digoxin, S		-	≥ 4.0	ng/mL
Disopyramide, S		-	≥ 7.0	mcg/mL
Doxepin and Nordoxepin, S			> 500	ng/mL
Ethanol, Blood		-	≥ 400	mg/dL
Ethanol, Serum		-	≥ 400	mg/dL
Ethosuximide, S		-	> 150	mcg/mL
Ethylene Glycol, S		-	≥ 20	mg/dL
Imipramine and Desipramine, S		-	> 400	ng/mL
Isopropanol (Volatile Screen), applies to all specimen types			Any value detected	mg/dL
Lidocaine, S		-	> 6.0	mcg/mL
Lead, Blood	0 – 15 yrs	-	≥ 20	mcg/dL
Lead, Blood	≥ 16 yrs	-	≥ 70	mcg/dL
Lithium, S		-	> 1.6	mmol/L
Methanol (Volatile Screen), applies to all specimen types		-	Any value detected	mg/dL
Nortriptyline, S		-	> 500	ng/mL
Phenobarbital, S		-	≥ 60.0	mcg/mL
Phenytoin, Total, S		-	≥ 30.0	mcg/mL
Phenytoin, Free, S		-	≥ 2.5	mcg/mL
Primidone and Phenobarbital, S Primidone Phenobarbital		-	 ≥ 15.0 ≥ 60.0	 mcg/mL mcg/mL
Procainamide, S Procainamide N-Acetylprocainamide		-	 > 12 ≥ 40	 mcg/mL mcg/mL
Quinidine, S		-	≥ 6.0	mcg/mL
Salicylates, S		-	≥ 50.0	mg/dL
Theophylline, S		-	> 20	mcg/mL
Trimipramine, S			> 500	ng/mL
Valproic Acid, Free and Total, S Free Valproic Acid Total Valproic Acid		-	 > 30 ≥ 151	 mcg/mL mcg/mL
Valproic Acid, Total, S		-	≥ 151	mcg/mL

MICROBIOLOGY

Result	Specimen source and patient details
Detection (e.g., stain, culture, PCR, antigen detection) of a clinically significant bacterium, fungus, parasite, or virus (except HIV and hepatitis A through E virus)	Blood, cerebrospinal fluid, brain tissue, amniotic fluid, ocular fluid/corneal scrapings
Identification/detection of a select agent (or other highly pathogenic organism) including, but not limited to *Bacillus anthracis*, *Brucella* species, *Burkholderia mallei*, *Burkholderia pseudomallei*, *Clostridium botulinum*, *Corynebacterium diphtheriae, Coxiella burnetii*, *Francisella tularensis*, monkeypox virus, variola virus, *Vibrio cholerae*, or *Yersinia pestis*. In the event of an outbreak of a novel contagious microorganism, detection of such an organism may fall into this category.	Any specimen tested
Detection of clinically significant fungi including, but not limited to members of the Zygomycetes class, dimorphic fungal pathogens (*Histoplasma capsulatum*, *Blastomyces dermatitidis*, or *Coccidioides* species), *Cryptococcus neoformans, Cryptococcus gattii*, or *Pneumocystis jiroveci*	Any specimen tested
Detection of *Strongyloides stercoralis* larvae	Non-intestinal specimen
Detection of herpes simplex virus or *Bordetella pertussis*	Any specimen tested from a neonate (< 1 month)

BODY FLUID ANALYSIS

BODY FLUID ANALYSIS

	Pleural		Peritoneal		Pericardial		Synovial	
Test	Normal (transudate)	Abnormal (exudates)	Normal (transudate)	Abnormal (exudates)	Normal (transudate)	Abnormal (exudates)	Normal (transudate)	Abnormal (exudates)
Amylase		2x serum: pancreatitis, esophageal rupture, carcinoma		Increased in pancreatic ascites and GI perforations	Of little diagnostic value			
Appearance & volume	Clear/straw-colored	Milky: chylous or pseudochylous Reddish: see cells below Turbid: lipid or WBCs Purulent: empyema Foul smell: anaerobic Bloody: neoplasm or membrane damage Anchovy paste: amebiasis	Clear/straw-colored	Turbid: infection Green: bile Blood-streaked: trauma, intestinal disorders, malignancy Chylous or pseudochylous: trauma, lymph obstruction	Clear/straw-colored: 10-50 ml present	Turbid or blood-streaked Milky – chylous or pseudochylous	Clear, colorless to pale yellow	Yellow, turbid; inflammation white, cloudy; may contain crystals
Total protein	< 3.0	> 3.0	< 3.0	> 3.0 ulcerative colitis	Of little diagnostic value	> 6.0 indicates abnormal effusion	< 3.0	>3.0; arthritis, gout
Fluid/serum TP ratio	< 0.5	> 0.5		> 0.5 suggests malignancy	Of little diagnostic value			
LD	< 200	> 200		Elevated in malignancy	Of little diagnostic value	> 300 indicates malignancy	Same as Serum	Higher than Serum; RA, gout, infection
Fluid/serum LD ratio	< 0.6	> 0.6		> 0.6 suggests malignancy	Of little diagnostic value			
CEA				10 suggests malignancy CEA ordered to correlate with cytology results		CEA ordered to correlate with cytology results		
Fluid/serum CEA ratio			> 1	< 1				
Glucose		< 30: rheumatoid effusion < 50: TB, empyema, carcinoma, infection		< 60 Decreased in tubercular peritonitis and malignancy	Of little diagnostic value	< 60-80 may indicate disease	Not more than 10mg/dL higher than blood drawn simultaneously	20-100 mg/dL less than blood; Infection
Uric Acid							Equivalent to Serum	> 8mg/dL indicates gout
Cholesterol	< 45-60 mg/dl	> 45-60 mg/dl						

BODY FLUID ANALYSIS

	Pleural		Peritoneal		Pericardial		Synovial	
Test	Normal (transudate)	Abnormal (exudates)	Normal (transudate)	Abnormal (exudates)	Normal (transudate)	Abnormal (exudates)	Normal (transudate)	Abnormal (exudates)
pH	~ 7.4	< 7.3 infectious 6.3 in cancer 7.3 patient requires chest tube drainage 6.0: possible introduction of gastric fluid through ruptured esophagus		May be decreased in infections	Of little diagnostic value			
Triglycerides		> 110 mg/dl: Increased in chylous effusion < 50 mg/dl: pseudochylous effusion		Increased in chylous ascites	Of little diagnostic value			
Cells: WBC	< 1000	> 1000: Neutrophils increase in bacterial infection, pancreatitis, or pulmonary infarction Lymphocytes: increase in TB, viral infections, malignancy, LE	< 500 Mononuclear in cirrhosis	> 500 > PMNs in acute bacterial, mononuclear in chronic infections, eosinophils in eosinophilic enteritis	Normal counts are of no diagnostic value	> 1000 w/increase in neutrophils indicates bacterial infection		
Cells: RBC	< 10,000 (may indicate pleural effusion	> 10,000: malignancy, pleural infarction, trauma, TB		Large amount suggests neoplasm, TB, pancreatitis, endometriosis, mesenteric thrombosis, trauma, visceral perforation				
Fluid/serum cholesterol ratio	< 0.3	> 0.3						
Bilirubin ratio	< 0.6	> 0.6						
Serum/ascites albumin gradient	> 1.1	< 1.1						

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