

### Urine Preservatives—Collection and Transportation for 24-Hour Urine Specimens

The Department of Laboratory Medicine and Pathology at Mayo Clinic initiated a study to determine stability of analytes under different preservative conditions. This reference chart, built from that study, will enable you to select either temperature conditions or preservatives to maximize the number of tests that can be performed on a single 24-hour collection.

**Note:** See the Test Catalog for test-specific collection requirements.

		Preservative Options											Transport Temperature		
		Temperature Preservation					-					Ambient			
Published Test Name	Test ID	Ambient	Refrigerate	Frozen	50% Acetic Acid	Boric Acid	Diazolidinyl Urea	6M Hydrochloric Acid	6M Nitric Acid	Sodium Carbonate	Thymol	Toluene	(Plain) Internal Only	External	Internal
Adrenal Mass Panel, 24 hour, Urine	ACC	No	OK	ОК	No	No	No	No	No	No	No	No	No	Frozen preferred ≤ 90 days Refrig ≤ 14 days	Frozen <b>OK</b>
Albumin, 24 Hour, Urine	ALB24	OK	Preferred	ОК	No	OK	No	No	No	No	OK	No	OK	Refrig preferred $\leq 7$ days Frozen OK $\leq 7$ days Ambient OK $\leq 7$ days	Ambient <b>0K</b>
Aldosterone, 24 Hour, Urine	ALDU	OK	ОК	ОК	Preferred	OK	No	No	No	No	No	No	OK	Refrig preferred ≤ 28 days Frozen 0K ≤ 28 days Ambient with preservative 0K ≤ 14 days	Ambient <b>0K</b>
Aldosterone with Sodium, 24 Hour, Urine	ALDNA	OK	ок	ОК	Preferred	OK	No	No	No	No	No	No	OK	Refrig preferred ≤ 14 days Frozen 0K ≤ 14 days Ambient with preservative 0K ≤ 7 days	Ambient <b>0K</b>
Alpha-1-Microglobulin, 24 Hour, Urine	A124	OK	Preferred	ОК	OK	OK	No	No	No	No	OK	No	OK	Refrig preferred $\leq 7$ days Frozen 0K $\leq 7$ days Ambient 0K $\leq 7$ days	Ambient <b>0K</b>
Aluminum, 24 Hour, Urine	ALU	ОК	Preferred	ОК	OK	No	No	ОК	ОК	No	No	No	OK	Refrig preferred ≤ 28 days Frozen 0K ≤ 28 days Ambient 0K ≤ 28 days	Ambient <b>0K</b>
Ammonium, 24 Hour, Urine	AMMO	No	ОК	ОК	OK	OK	Preferred	ОК	No	No	ОК	No	No	Refrig preferred ≤ 14 days Frozen 0K ≤ 14 days Ambient 0K ≤ 72 hours	Ambient <b>0K</b>
Arsenic with Reflex, 24 Hour, Urine	ASU24	ОК	Preferred	ОК	OK	No	No	OK	ОК	No	No	No	OK	Refrig preferred ≤ 28 days Frozen 0K ≤ 28 days Ambient 0K ≤ 72 hours	Ambient <b>0K</b>
Arsenic Speciation, 24 Hour, Urine	SPASU	No	Preferred	ОК	OK	No	No	OK	No	No	No	No	No	Refrig preferred 28 days Frozen 28 days Ambient 72 hours	Ambient <b>0K</b>
Arylsulfatase A, 24 Hour, Urine	ARSU	No	Required	No	No	No	No	No	No	No	No	No	No	Refrig preferred ≤ 14 days Frozen NO Ambient NO	Ambient <b>0K</b>
Cadmium, 24 Hour, Urine	CDU	ОК	Preferred	ОК	OK	No	No	ОК	ОК	No	No	No	OK	Refrig preferred ≤ 28 days Frozen OK ≤ 28 days Ambient OK ≤ 28 days	Ambient <b>0K</b>
Calcium, 24 Hour, Urine	CALU	ОК	Preferred	ОК	OK	ОК	ОК	ОК	OK	No	ОК	No	ОК	Refrig preferred $\leq 14$ days Frozen OK $\leq 14$ days Ambient OK $\leq 72$ hours	Ambient <b>0K</b>
Catecholamine Fractionation, Free, 24 Hour, Urine	CATU	No	ОК	OK	Preferred	OK	No	ОК	OK	No	No	No	No	Refrig preferred $\leq$ 7 days Frozen OK $\leq$ 14 days Ambient with preservative OK $\leq$ 7 days	Ambient <b>0K</b>

# ${\it Urine\ Preservatives} \color{red} - {\it Collection\ and\ Transportation\ for\ 24-Hour\ Urine\ Specimens\ ({\it continued})}$

Preservative Options Transport Temperature												IrΩ			
		Temperature Preservation			50%		ı cəcı valı	ii anaport iemperatu							
Published Test Name	Test ID		Refrigerate		Acetic Acid	Boric Acid	Diazolidinyl Urea	6M Hydrochloric Acid	6M Nitric Acid	Sodium Carbonate	Thymol	Toluene	Ambient (Plain) Internal Only	External	Internal
Chloride, 24 Hour, Urine	CLU	OK	Preferred	OK	OK	OK	ОК	No	No	ОК	ОК	No	ОК	Refrig preferred $\leq$ 14 days Frozen 0K $\leq$ 30 days Ambient 0K $\leq$ 7 days	Ambient <b>OK</b>
Chromium, 24 Hour, Urine	CRU	OK	Preferred	OK	No	No	No	No	No	No	No	No	ОК	Refrig preferred $\leq 28$ days Frozen 0K $\leq 28$ days Ambient 0K $\leq 28$ days	Ambient <b>OK</b>
Citrate Excretion, 24 Hour, Urine	CITR	No	OK	OK	No	OK	Preferred	No	No	No	ОК	No	No	Refrig preferred ≤ 14 days Frozen 0K ≤ 14 days Ambient NO	Ambient <b>0K</b>
Cobalt, 24 Hour, Urine	COU	OK	Preferred	OK	No	No	No	No	No	No	No	No	ОК	Refrig preferred ≤ 28 days Frozen 0K ≤ 28 days Ambient 0K ≤ 28 days	Ambient <b>0K</b>
Copper, 24 Hour, Urine	CUU	OK	Preferred	OK	OK	No	No	ОК	OK	No	No	No	ОК	Refrig preferred ≤ 28 days Frozen 0K ≤ 28 days Ambient 0K ≤ 28 days	Ambient <b>OK</b>
Cortisol/Cortisone, Free, 24 Hour, Urine	COCOU	No	ОК	OK	OK	Preferred	No	No	No	No	No	No	No	Refrig preferred ≤ 14 days Frozen 0K ≤ 28 days Ambient with preservative 0K ≤ 72 hours	Ambient <b>0K</b>
Cortisol, Free, 24 Hour, Urine	CORTU	No	ОК	OK	OK	Preferred	No	No	No	No	No	No	No	Refrig preferred ≤ 14 days Frozen 0K ≤ 28 days Ambient with preservative 0K ≤ 7 days	Ambient <b>OK</b>
Creatinine, 24 Hour, Urine	СТИ	OK	Preferred	OK	OK	OK	ОК	ОК	No	OK	ОК	No	ОК	Refrig preferred $\leq$ 30 days Frozen 0K $\leq$ 30 days Ambient 0K $\leq$ 30 days	Ambient <b>OK</b>
Creatinine Clearance, Serum and 24 Hour Urine	CRCL	Preferred	ОК	OK	OK	OK	ОК	ОК	ОК	ОК	ОК	No	Preferred	Refrig preferred Frozen OK Ambient OK	Ambient <b>0K</b>
Cystinuria Profile, Quantitative, 24 Hour, Urine	CYSQN	No	OK	OK	No	No	No	No	No	No	No	Preferred	No	Frozen preferred ≤ 70 days Refrig ≤ 14 days Ambient NO	Ambient <b>OK</b>
2, 3-Dinor-11 Beta-Prostaglandin F2 Alpha, Urine	23BPT	No	Preferred	OK	OK	OK	No	No	No	OK	No	No	No	Refrig preferred $\leq$ 14 days Frozen 0K $\leq$ 30 days Ambient 0K $\leq$ 8 hours	Ambient <b>OK</b>
Electrophoresis, Protein, 24 Hour, Urine	EPU PEU (internal)	OK	Preferred	OK	No	No	OK	No	No	No	OK	No	ОК	Refrig preferred $\leq$ 14 days Frozen OK $\leq$ 5 days Ambient OK $\leq$ 72 hours	Ambient <b>OK</b>
Gadolinium, 24 Hour, Urine	GDU	OK	Preferred	OK	No	No	No	ОК	ОК	No	No	No	ОК	Refrig preferred $\leq$ 28 days Frozen OK $\leq$ 28 days Ambient OK $\leq$ 28 days	Ambient <b>0K</b>
Heavy Metals Screen, with Reflex, 24 Hour, Urine	HMU24	No	Preferred	OK	OK	No	No	ОК	No	No	No	No	No	Refrig preferred ≤ 7 days Frozen OK ≤ 7 days Ambient NO	Ambient <b>0K</b>
Homovanillic Acid, 24 Hour, Urine	HVA	No	No	No	Preferred	No	No	ОК	ОК	No	No	No	No	Refrig preferred ≤ 28 days Frozen OK ≤ 180 days Ambient NO	Ambient <b>OK</b>

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# ${\it Urine\ Preservatives} \color{red} - {\it Collection\ and\ Transportation\ for\ 24-Hour\ Urine\ Specimens\ ({\it continued})}$

	1	Preservative Options												Transport Temperature	
		Temper	rature Presei	vation	50%		1000114	6M	6M				Ambient	Transport Tomp	
Published Test Name	Test ID		Refrigerate		Acetic Acid	Boric Acid	Diazolidinyl Urea	Hydrochloric Acid	Nitric Acid	Sodium Carbonate	Thymol	Toluene	(Plain) Internal Only	External	Internal
5-Hydroxyindoleacetic Acid, 24 Hour, Urine	HIAA	No	ОК	OK	Preferred	OK	No	OK	OK	ОК	ОК	ОК	No	Refrig preferred ≤ 56 days Frozen OK ≤ 365 days Ambient NO	Ambient <b>0K</b>
Immunoglobulin Total Light Chains, Urine	TLCU	OK < 72 hours	Preferred	ОК	No	No	No	No	No	No	No	No	< 72 hours OK	Refrig preferred ≤ 7 days Frozen OK ≤ 20 days Ambient OK ≤ 72 hours	Ambient <b>OK</b>
lodine, 24 Hour, Urine	UIOD	OK	Preferred	OK	OK	No	No	No	No	No	No	No	ОК	Refrig preferred ≤ 146 days Frozen OK ≤ 146 days Ambient OK ≤ 146 days	Ambient <b>OK</b>
Lead, 24 Hour, Urine	PBU	OK	Preferred	OK	OK	No	No	OK	ОК	No	No	No	ОК	Refrig preferred $\leq$ 28 days Frozen OK $\leq$ 28 days Ambient OK $\leq$ 28 days	Ambient <b>OK</b>
Leukotriene E4, Urine	LTE4	OK	Preferred	ОК	OK	OK	No	No	No	OK	No	No	ОК	Refrig preferred $\leq$ 7 days Frozen OK $\leq$ 30 days Ambient OK $\leq$ 24 hours	Ambient <b>0K</b>
Magnesium, 24 Hour, Urine	MAGU	OK	Preferred	OK	OK	OK	ОК	OK	No	No	OK	No	ОК	Refrig preferred $\leq$ 14 days Frozen OK $\leq$ 30 days Ambient OK $\leq$ 72 hours	Ambient <b>0K</b>
Manganese, 24 Hour, Urine	MNU	OK	Preferred	OK	No	No	No	No	No	No	No	No	ОК	Refrig preferred $\leq$ 28 days Frozen OK $\leq$ 28 days Ambient OK $\leq$ 7 days	Ambient <b>OK</b>
Mercury, 24 Hour, Urine	HGU	No	Preferred	OK	OK	No	No	OK	ОК	No	No	No	No	Refrig preferred $\leq$ 7 days Frozen OK $\leq$ 7 days Ambient NO	Ambient <b>0K</b>
Metanephrines, Fractionated, 24 Hour, Urine	METAF	No	ОК	OK	Preferred	Preferred	No	OK	OK	ОК	No	OK	No	Refrig preferred $\leq$ 28 days Frozen OK $\leq$ 28 days Ambient OK $\leq$ 28 days	Ambient <b>OK</b>
Metanephrines with 3-Methoxytyramine, 24 Hour, Urine	МЕТА3	OK	ОК	OK	OK	OK	No	OK	OK	ок	No	OK	No	Refrig preferred ≤ 28 days Frozen OK ≤ 28 days Ambient OK ≤ 28 days	Ambient <b>0K</b>
3-Methoxytyramine, 24 Hour, Urine	ЗМТ	OK	ОК	OK	Preferred	Preferred	No	OK	OK	ОК	No	OK	ОК	Refrig preferred ≤ 28 days Frozen OK ≤ 90 days Ambient OK ≤ 28 days	Ambient <b>0K</b>
N-Methylhistamine, 24 Hour, Urine	NMH24	OK	Preferred	OK	OK	OK	No	OK	OK	ок	No	No	ОК	Refrig preferred $\leq$ 28 days Frozen OK $\leq$ 28 days Ambient OK $\leq$ 14 days	Ambient <b>0K</b>
Monoclonal Protein Study, 24 Hour, Urine	MPSU	OK	Preferred	OK	No	No	ОК	No	No	No	OK	No	ОК	Refrig preferred ≤ 14 days Frozen OK ≤ 5 days Ambient OK ≤ 24 hours	Ambient <b>0K</b>
Nickel, 24 Hour, Urine	NIU	OK	Preferred	OK	OK	No	No	No	OK	No	No	No	ОК	Refrig preferred ≤ 28 days Frozen OK ≤ 28 days Ambient OK ≤ 28 days	Ambient <b>0K</b>
Nitrogen, Total, 24 Hour, Urine	NITU	OK	Preferred	ОК	OK	No	No	OK	No	ОК	ОК	No	ОК	Refrig preferred $\leq$ 7 days Frozen OK Ambient OK $\leq$ 7 days	Ambient <b>0K</b>
Oxalate, 24 Hour, Urine	OXU	No	ОК	ОК	No	No	Preferred	No	No	No	ОК	No	No	Refrig preferred ≤ 14 days Frozen OK ≤ 14 days Ambient NO	Ambient <b>OK</b>

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# ${\it Urine\ Preservatives} \color{red} - {\it Collection\ and\ Transportation\ for\ 24-Hour\ Urine\ Specimens\ ({\it continued})}$

						P	reservativ	Transport Temperature							
		Temperature Preservation						-					Ambient	-	Ī
					50% Acetic	Boric	Diazolidinyl	6M Hydrochloric	6M Nitric	Sodium			(Plain) Internal		
Published Test Name	Test ID	Ambient	Refrigerate	Frozen	Acid	Acid	Urea	Acid	Acid	Carbonate	Thymol	Toluene	Only	External	Internal
Phosphorus, 24 Hour,														Refrig preferred ≤ 14 days	
Urine	POU	OK	Preferred	OK	0K	OK	OK	OK	No	No	OK	No	OK	Frozen OK ≤ 30 days	Ambient <b>OK</b>
														Ambient OK ≤ 7 days Refrig preferred ≤ 7 days	
pH, 24 Hour, Urine	UPH24	No	OK	OK	No	No	Preferred	No	No	No	No	No	No	Frozen OK ≤ 7 days	Ambient <b>0K</b>
														Ambient NO	
Porphyrins, Quantitative,	PQNU	No	No	No	No	No	No	No	No	Required	No	No	No	Frozen ≤ 7 days Refrig NO	Refrig OK Ambient NO
24 Hour, Urine	PUNU	INO	INO	INO	INU	INO	INO	INU	INO	nequireu	INO	INO	INO	Ambient NO	Protect from light
Potassium, 24 Hour,														Refrig preferred ≤ 14 days	
Urine	KUR	OK	Preferred	OK	0K	OK	OK	OK	No	OK	OK	No	OK	Frozen OK ≤ 30 days	Ambient <b>OK</b>
														Ambient OK ≤ 7 days  Refrig preferred ≤ 14 days	
Protein, Total, 12 Hour, Urine	12PU1	OK	Preferred	OK	No	OK	OK	No	No	No	OK	No	OK	Frozen OK ≤ 30 days	Ambient <b>0K</b>
Offile														Ambient 0K ≤ 24 hours	
Protein, Total, 24 Hour,	PTU	No	Preferred	OK	No	ОК	ОК	No	No	No	OK	No	No	Refrig preferred ≤ 14 days Frozen OK ≤ 30 days	Ambient <b>OK</b>
Urine	110	INO	Ticiciica		INO	OK	OK	INO	INO	140	OK	110	INO	Ambient OK ≤ 24 hours	Ambient ok
Retinol-Binding Protein,														Refrig preferred ≤ 7 days	
24 Hour, Urine	RB24	No	Preferred	OK	No	OK	No	No	No	No	No	No	No	Frozen OK ≤ 7 days Ambient NO	Ambient <b>OK</b>
0														Refrig preferred ≤ 28 days	
Serotonin, 24 Hour, Urine	SERU	OK	Preferred	OK	Preferred	No	No	No	OK	No	No	OK	OK	Frozen OK ≤ 28 days	Refrig <b>OK</b>
O'IIIO														Ambient OK ≤ 48 hours  Refrig preferred ≤ 14 days	
Sodium, 24 Hour, Urine	NAU	ОК	Preferred	ОК	ОК	ОК	ОК	OK	No	No	ОК	No	ОК	Frozen OK $\leq$ 30 days	Ambient <b>0K</b>
														Ambient OK ≤ 7 days	
Culfata 04 Haur Hrina	CIII EII	No	Dueferred	OK	No	OV	OV	No	No	OV	OV	No	No	Refrig preferred ≤ 14 days	Ambient OV
Sulfate, 24 Hour, Urine	SULFU	No	Preferred	OK	No	OK	OK	No	No	OK	OK	No	No	Frozen OK ≤ 14 days Ambient NO	Ambient <b>OK</b>
Supersaturation Profile,														Refrig preferred ≤ 14 days	
24 Hour, Urine	SAT24	No	OK	OK	No	No	Preferred	No	No	No	No	No	No	Frozen OK ≤ 14 days	Ambient <b>0K</b>
														Ambient N0 Refrig preferred ≤ 28 days	
Thallium, 24 Hour, Urine	TLU	OK	Preferred	OK	OK	No	No	OK	OK	No	No	No	OK	Frozen OK ≤ 28 days	Ambient <b>OK</b>
														Ambient OK ≤ 28 days	
Urea, 24 Hour, Urine	URAU	No	OK	OK	ОК	Preferred	OK	OK	No	OK	OK	No	No	Refrig preferred ≤ 14 days Frozen OK ≤ 30 days	Ambient <b>OK</b>
oroa, 2 i riour, orino	011/10	140	O.K		OIC	riolollou	O.K	O.K	140	OIC	OIX	110	140	Ambient OK ≤ 7 days	Ambione on
														Refrig preferred ≤ 14 days	
Uric Acid, 24 Hour, Urine	URCU	No	OK	OK	No	Preferred	OK	No	No	OK	OK	No	No	Frozen OK ≤ 30 days Ambient OK ≤ 7 days	Ambient <b>OK</b>
March Land Arthur														Refrig preferred ≤ 28 days	
Vanillylmandelic Acid, 24 Hour. Urine	VMA	No	No	No	Preferred	OK	No	OK	OK	No	No	No	No	Frozen OK ≤ 180 days	Ambient <b>0K</b>
														Ambient N0 Refrig preferred ≤ 28 days	
Zinc, 24 Hour, Urine	ZNU	ОК	Preferred	ОК	ОК	No	No	OK	OK	No	No	No	ОК	Frozen $OK \le 28$ days	Ambient <b>OK</b>
,,													2	Ambient OK ≤ 28 days	

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### Urine Preservatives—Collection and Transportation for 24-Hour Urine Specimens (continued)

The conditions and concentrations of urine preservatives are defined for 24-hour collections as follows:

Ambient	Room temperature (21–25 degrees C)						
Refrigerated	4–8 degrees C						
Frozen	-20 degrees C						
50% Acetic Acid	25 mL per 24-hour collection						
Boric Acid (crystals)	10 g per 24-hour collection						
Diazolidinyl Urea (250 g/L)	5 mL per 24-hour collection						
6M Hydrochloric Acid	30 mL per 24-hour collection						
6M Nitric Acid	15 mL per 24-hour collection						
Sodium Carbonate (crystals)	5 g per 24-hour collection						
Thymol (10% in isopropanol)	10 mL per 24-hour collection						
Toluene	30 mL per 24-hour collection						

Preservative and condition guidelines have been evaluated specifically for Mayo Clinic Laboratories assays. If you have questions regarding the use of preservatives, contact Mayo Clinic Laboratories at 800-533-1710 or 507-266-5700.

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