

Citrate, 24-hr Urine Reference Intervals

Age in years	Lower Limit mmol/24 hours	Upper Limit mmol/24 hours	Age in years	Lower Limit mmol/24 hours	Upper Limit mmol/24 hours
20 - <21	0.78	6.20	41 - <42	1.56	6.20
21 - <22	0.82	6.20	42 - <43	1.59	6.20
22 - <23	0.85	6.20	43 - <44	1.63	6.20
23 - <24	0.89	6.20	44 - <45	1.67	6.20
24 - <25	0.93	6.20	45 - <46	1.71	6.20
25 - <26	0.97	6.20	46 - <47	1.74	6.20
26 - <27	1.00	6.20	47 - <48	1.78	6.20
27 - <28	1.04	6.20	48 - <49	1.82	6.20
28 - <29	1.08	6.20	49 - <50	1.86	6.20
29 - <30	1.11	6.20	50 - <51	1.89	6.20
30 - <31	1.15	6.20	51 - <52	1.93	6.20
31 - <32	1.19	6.20	52 - <53	1.97	6.20
32 - <33	1.22	6.20	53 - <54	2.00	6.20
33 - <34	1.26	6.20	54 - <55	2.04	6.20
34 - <35	1.30	6.20	55 - <56	2.08	6.20
35 - <36	1.34	6.20	56 - <57	2.11	6.20
36 - <37	1.37	6.20	57 - <58	2.15	6.20
37 - <38	1.41	6.20	58 - <59	2.19	6.20
38 - <39	1.45	6.20	59 - <60	2.22	6.20
39 - <40	1.48	6.20	60 - <61	2.26	6.20
40 - <41	1.52	6.20			
There are no reference ranges for patients <20 y or > 60 y					

Urinary citrate is a major inhibitor of kidney stone formation due in part to binding of calcium in urine. Low urine citrate levels are considered a risk for kidney stone formation.

Several metabolic disorders are associated with low urine citrate. Any condition that lowers renal tubular pH or intracellular pH may decrease citrate (eg, metabolic acidosis, increased acid ingestion, hypokalemia, or hypomagnesemia).

Low urinary citrate promotes kidney stone formation and growth, and is subject to therapy by correcting acidosis, hypokalemia, or hypomagnesemia by altering diet or using drugs such as citrate and potassium.

Any value less than the mean for 24 hours represents a potential risk for kidney stone formation and growth. Patients with low urinary citrate, and new or growing stone formation, may benefit from adjustments in therapy known to increase urinary citrate excretion.

Very low levels <0.78 mmol/24 hours suggest investigation for the possible diagnosis of renal tubular acidosis.