



1-800-533-1710

Supersaturation, 24 HR, Home Kit, U 1

SSIN1

PATIENT NAME TESTING, SSH24					ORDER NUMBER N214000061
PATIENT ID SA00161137	DATE OF BIRTH 09/23/1997	AGE 25 Y	SEX Male	REQUESTED BY CLIENT CLIENT	
COLLECTED 7/14/2023, 12:00 AM	RECEIVED 7/14/2023, 8:02 AM	REPORTED 7/14/2023, 9:09 AM			
The collected, received, and reported dates and times on the report are in the time zone of the performing location.				CLIENT ORDER NUMBER SA00161137	
7028846 MCL Rochester Campus Rochester MN 55901				CLIENT MRN SA00161137	

RESULT(S)					
RESULT NAME	RESULT	FLAG	UNITS	REFERENCE VALUES	RESULT COMMENT
Calcium Oxalate Crystal	1.79		DG	Reference Mean= 1.89	
Brushite Crystal	-1.26		DG	Reference Mean= 0.46	
Hydroxyapatite Crystal	2.76		DG	Reference Mean= 4.19	
Uric Acid Crystal	-0.84		DG	Reference Mean= 1.18	
Collection Duration	24		h		
Volume	2000		mL		
Patient Street Address	1234				
Patient City	Lake City				
Patient State	MN				
Patient Zip Code	55041				
Patient Country	USA				
Patient Home Phone	123456				

INTERPRETATION

The DG is related to supersaturation. DG is negative for undersaturated solutions, zero for solutions at the solubility product, and positive for saturated solutions.

Any value greater than the Reference Mean is considered a risk for the respective crystal type formation.

In general, a higher calculated SS means the risk for forming that type of stone is increased. A positive DG value indicates that the urine is supersaturated for that crystal type.

SSIN1 is the reportable component of the orderable test code, SSH24. A full copy of the interpretative report is available as a PDF appended to this cover sheet and is ready to review.

Code : MCR Laboratory : Mayo Clinic Laboratories - Rochester Main Campus

Lab Director : WILLIAM G MORICE

MD, PHD

CLIA Certificate : 24D0404292

Address : 200 FIRST STREET SW

ROCHESTER MN 55905

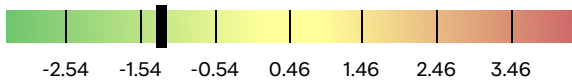
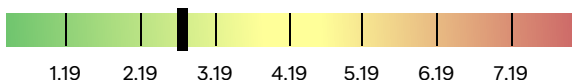
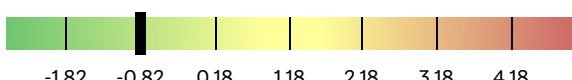


Patient ID SA00161137	Patient Name TESTING, SSH24	Birth Date 09/23/1997	Sex M	Age 25	Weight N/A
Order Number N214000061	Client Order Number SA00161137	Ordering Physician CLIENT, CLIENT	Previous Supersaturation Testing: No prior supersaturation tests for this patient identified.		
Account Information C7028846 MCL Rochester Campus		Collection Date* 07/14/2023 00:00			

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Overall Calculated Supersaturation Profile By Stone Type

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Stone Type	Patient Supersaturation Delta Gibbs (DG)	Non-Stone Formers**		Deviation from Reference Mean	
		Mean	25% - 75% Range	<Less Stone Risk	More Stone Risk>
Calcium Oxalate	1.79	1.89	1.42 - 2.13		
Calcium Phosphate (Brushite)	-1.26	0.46	-0.41 - 1.32		
Calcium Phosphate (Hydroxyapatite)	2.76	4.19	3.33 - 5.31		
Uric Acid	-0.84	1.18	-1.10 - 3.41		

** Based on normal value study of 48 adult men and 52 adult women

The DG is related to supersaturation. DG is negative for undersaturated solutions, zero for solutions at the solubility product, and positive for saturated solutions. Any value greater than the Reference Mean is considered a risk for the respective crystal type formation.

In general, a higher calculated SS means the risk for forming that type of stone is increased. A positive DG value indicates that the urine is supersaturated for that crystal type.

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MCR	Mayo Clinic Laboratories-Rochester Main Campus	200 First Street SW, Rochester, MN 55905	WILLIAM MORICE MD, PHD	24D0404292



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Urine pH

5.9

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Reference Value
4.5-8.0

<Favors Uric Acid Stones

Favors Calcium Phosphate Stones>

Creatinine

1080 mg/24 h

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Reference Value
930-2955

<Likely Under-Collected

Likely Over-Collected>

Normalized Values

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Analyte Ratio	Result	Normal Range*
Calcium/Creatinine	0.19	<0.25 mg/mg
Oxalate/Creatinine	0.02	<0.03 mg/mg
Uric Acid/Creatinine	0.28	<0.60 mg/mg
*Literature-based normal values		

Analyte Ratio	Result	Normal Range*
Phosphorus/Creatinine	0.39	<0.75 mg/mg
Magnesium/Creatinine	0.09	>0.05 mg/mg
Citrate/Creatinine [1]	0.40	>0.25 mg/mg
*Literature-based normal values		

Metabolic Risk Factors

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Analyte	Result (24 h)*	Non-Stone Formers**		Relative Risk
		Median	25% -75% Range	
Calcium	200 mg	234	159 - 291	
Oxalate [1]	0.30 mmol	0.30	0.25 - 0.35	
Uric Acid	300 mg	685	565 - 833	
Citrate [1]	430 mg	637	492 - 911	
* Items are flagged based upon the reference range cut-offs				
** Based on normal value study of 48 adult men and 52 adult women				

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Dietary Risk Factors

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Analyte		Result (24 h)*	Non-Stone Formers**		Relative Risk
			Median	25% -75% Range	
Red = More Stone Risk					Green = Less Stone Risk
Fluid Intake	Volume	2000 mL	1307	1119 - 2037	
	Osmolality	368 mOsm/kg	693	550 - 815	
Salt Intake	Sodium	72 mmol	187	156 - 247	
	Chloride	50 mmol	189	149 - 225	
Fruits/Veggies	Potassium	62 mmol	72	54 - 88	
	Magnesium	100 mg	140	101 - 157	
Protein Intake	Sulfate ①	22 mmol	27	23 - 31	
	Urea Nitrogen	11.5 g	11.5	7.8 - 14.3	
	PCR	97 g	97	73 - 114	
Other	Phosphorus	420 mg	1164	1010 - 1419	
	Ammonium ②	43 mmol	31	24.5 - 42	

* Items are flagged based upon the reference range cut-offs

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Urine Supersaturation Laboratory Trends Over Time

No laboratory trends over time

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General Comments - Adult Male Patients

Metabolic Risk Factors

Urine values that affect stone risk due to combinations of genetic and environmental influences.

Analyte	Non-Stone Formers 25 - 75% Range	Comment
Calcium	159 - 291	Hypercalciuria is a common risk for calcium oxalate and calcium phosphate stones. Most cases are idiopathic (familial/genetic) but hyperparathyroidism and other secondary causes need to be considered.
Oxalate	0.25 - 0.35	Hyperoxaluria is a common risk factor for calcium oxalate kidney stones. Mild hyperoxaluria is usually due to dietary imbalance between high oxalate intake and/or low calcium intake. Moderate increases (0.5 – 1.0 mM) are often due to enteric hyperoxaluria while values greater than 1.0 mM suggest the possibility of primary hyperoxaluria.
Uric Acid	565 - 833	Hyperuricosuria is usually due to a high protein/purine diet and is a risk factor for calcium oxalate stones. Low urinary pH is much more important risk factor for uric acid stones. Dietary intervention and or allopurinol can be considered.
Citrate	492 - 911	Low urinary citrate is a risk factor for calcium oxalate and calcium phosphate kidney stones. High-protein diet, lower gastrointestinal losses, and renal tubular acidosis are potential causes. Can treat with dietary intervention versus oral alkali such as potassium citrate.
pH	5.7 - 6.3	Low urine pH (<5.5) is a risk factor for uric acid stones while high urine pH (>6.5) is a risk factor for calcium phosphate stones.

Normalized Values

Normalizing urine values to urinary creatinine excretion can help to adjust for over or under collection of a 24 hr urine.

Analyte	Reference Range, 95%	Comment
Calcium / Creatinine	<0.25 mg/mg	When high, treat as if 24 hour urinary calcium excretion were high.
Oxalate / Creatinine	<0.03 mg/mg	When high, treat as if 24 hour urinary oxalate excretion were high.
Uric acid / Creatinine	<0.60 mg/mg	When high, treat as if 24 hour urinary uric acid excretion were high.
Phosphorus / Creatinine	<0.75 mg/mg	When high, treat as if 24 hour urinary phosphorus excretion were high.
Magnesium / Creatinine	>0.05 mg/mg	When low, treat as if 24 hour urinary magnesium excretion were low.
Citrate / Creatinine	>0.25 mg/mg	When low, treat as if 24 hour urinary citrate excretion were low.

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Dietary Risk Factors

Urine values that reflect dietary intakes.

Analyte	Non-Stone Formers 25 - 75% Range	Comment
Volume	1119 - 2037	Low values are risk factor for all forms of kidney stones. Target at least 2 L per day although more may be necessary for larger individuals.
Osmolality	550 - 815	Urine osmolality is a better index of fluid intake and kidney stone risk than volume alone. Target urine osmolality less than 400.
Sodium	156 - 247	Urine sodium reflects dietary salt intake. Target less than 100 mEq per day.
Chloride	149 - 225	Urine chloride reflects dietary salt intake. Target less than 100 mEq per day.
Potassium	54 - 88	Very low values (<20 mEq) suggests gastrointestinal losses or chronic potassium deficiency. Higher values are typically seen with higher fruit and vegetable intake or use of potassium supplements.
Magnesium	101 - 157	Very low values (<60 mg) suggests gastrointestinal losses or malnutrition. High values suggest increased dietary magnesium intake via laxatives, magnesium supplements, or specific magnesium rich foods.
Sulfate	23 - 31	Sulfate is found in certain amino acids. Higher values suggest higher protein intake.
Urea Nitrogen	7.8 - 14.3	Urine urea nitrogen is derived from protein metabolism. Higher values suggest higher protein intake.
Protein Catabolic Rate (PCR)	73 - 114	This value is calculated from the urine urea nitrogen. Higher values suggest higher protein intake.
Phosphorus	1010 - 1419	Lower values suggest gastrointestinal losses or malnutrition. Higher values suggest high phosphorus intake. Does not directly alter kidney stone risk.

Calculated Supersaturation

The computer program EQUIL2 combines key urinary concentrations to estimate the urinary supersaturation for common stone types. Delta G stands for the thermodynamic term delta Gibbs. Positive Delta G values imply oversaturation and negative values undersaturation for that crystal type.

Analyte	Non-Stone Formers 25 - 75% Range	Comment
Calcium Oxalate	1.42 - 2.13	Most persons are somewhat oversaturated for calcium oxalate, but stone formers more so. Higher calcium and oxalate, lower volume and citrate all increase calcium oxalate SS.
Calcium Phosphate (Brushite)	-0.41 - 1.32	Although rare in stones, brushite is the most thermodynamically stable form of calcium phosphate. High urine pH (> 6.3) greatly increases brushite SS.
Calcium Phosphate (Hydroxyapatite)	3.33 - 5.31	The most common form of calcium phosphate in stones. High urine pH (> 6.3) greatly increases hydroxyapatite SS.
Uric Acid	-1.10 - 3.41	Low urine pH (<5.5) greatly increases uric acid SS.

Laboratory Notes

- This test was developed and its performance characteristics determined by Mayo Clinic in a manner consistent with CLIA requirements. This test has not been cleared or approved by the U.S. Food and Drug Administration.
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