**( for > 12 years age)**

| | | |
|---|---|---|
| **KIDNEY STONE FORMATION THERAPEUTIC MONITORING PANEL** (Spectrophotometry, Enzymatic Indirect ISE) | | |
| **ACIDIFIED URINE** | | |
| pH | | |
| Total Volume | mL/day | |
| Creatinine | mg/Kg/day | |
| Calcium | mg/day | (100.00 – 300.00) |
| Phosphorus | mg/day | (400.00-1300.00) |
| Oxalate | mg/day | |
| Citrate | mmol/24 hrs | (2.00 -5.00) |
| **NON ACIDIFIED URINE** | | |
| pH | | |
| Total Volume | mL/day | |
| Magnesium | mg/day | (73.00-122.00) |
| Sodium | mEq/day | |
| Uric Acid | mg/day | (250.00- 750.00) |
| Osmolality | mOsm/Kg $H_2O$ | (300.00- 900.00) |

**( for < 12 years age)**

| | | |
|---|---|---|
| **KIDNEY STONE FORMATION THERAPEUTIC MONITORING PANEL** (Spectrophotometry, Enzymatic Indirect ISE) | | |
| **ACIDIFIED URINE** | | |
| pH | | |
| Total Volume | mL/day | |
| Creatinine | mg/Kg/day | |
| Calcium | mg/Kg/day | ( <6.00) |
| Phosphorus | mg/day | (400.00-1300.00) |
| Oxalate | mg/day | |
| Citrate | mmol/24 hrs | (2.00 – 5.00) |
| **NON ACIDIFIED URINE** | | |
| pH | | |
| Total Volume | mL/day | |
| Magnesium | mg/day | (73.00-122.00) |
| Sodium | mEq/day | |
| Uric Acid | mg/day | (250.00-750.00) |
| Osmolality | mOsm/Kg$H_2O$ | (300.00-900.00) |

| **AGE IN YEARS** | **SODIUM** |
|---|---|
| **0-1** | **-** |
| **1-6** | **-** |
| 6-10<br>Males<br>Females | <br>41-115<br>20-69 |

| | |
|---|---|
| 10-14<br>Males<br>Females | <br>63-177<br>48-168 |
| >14 | 40-220 |

| AGE IN YEARS | REFERENCE RANGE FOR OXALATE IN mg/day |
|---|---|
| < 18 | 13.00 – 38.00 |
| >18<br>Males<br>Females | <br>7.00 -44.00<br>4.00- 31.00 |

| AGE IN YEARS | REFERENCE RANGE FOR CREATININE IN mg/Kg/day |
|---|---|
| 0 - 1 | 8.00 – 20.00 |
| 2- 12 | 8.00-22.00 |
| 13-18 | 8.00-30.00 |
| >18<br>Males<br>Females | <br>14.00-26.00<br>11.00-20.00 |

**Comment**

This metabolic screening assay for Kidney stones is recommended in patients who are frequently forming stones. The assay helps to intervene therapeutically for monitoring these patients.

Kidney stone formation is considered to be a nutritional or environmental disease linked to affluence but genetic / anatomical abnormalities may also play a significant role. For most stone types there is male preponderance. Majority of kidney stones are composed of Calcium oxalate with or without phosphate ( 67 %), Magnesium ammonium phosphate ( 12 %), Calcium phosphate ( 8 %), Urate (8%) and complex mixtures of all these ( 2 – 3 %). Hypocitraturia ( low citrate levels) is an important risk factor for Calcium and Uric Acid stones.

**Causes of Hypocitraturia**- Renal tubular acidosis, Potassium/Magnesium deficiency, Urinary tract infection, Kidney failure & Chronic diarrhea.

Formation of Calcium salts of oxalate in the urinary tract is a major factor in Urolithiasis. Increased urinary excretion of oxalate can be due to increased ingestion of oxalate rich foods, metabolic defects like Primary hyperoxaluria and increased absorption of oxalate in gastrointestinal disorders that produce fat malabsorption like Inflammatory bowel disease, Ileal resection, Biliary diversion, Pancreatic insufficiency, Sprue, Jejunoileal bypass and Small intestinal statis with bacterial over growth.