NutriPATH
Integrative Pathology Services
P: 1300 688 522
E: info@nutripath.com.au
A: PO Box 442 Ashburton VIC 3142

TEST PATIENT
Sample Test Name
Sex : F
Date Collected : 00-00-0000
111 TEST ROAD TEST SUBURB
LAB ID: 00000000 UR#:0000000

TEST PHYSICIAN
DR JOHN DOE
111 CLINIC STREET
CLINIC SUBURB VIC 3000

INTEGRATIVE MEDICINE

URINE, SPOT	Result	Range	Units
Environmental Pollutants			
HVA	*2.3* *L	2.5 - 3.5	mmol/molC
5HIAA	*20.0* *H	3.0 - 4.5	mmol/molC

Dopaminergic Activity Comment

[HVA] (Homovanillate) a Dopamine catabolite - LOW
Results show low Catecholamine Metabolism. Homovanillic Acid from Dopamine conversion via 3-methoxy-tyramine. Suggestive of low MAO.
Causes: Chronic Stress, Anti-psychotic medications.
Symptoms & Conditions: Depression, Sleep disturbances, Anxiety, Fatigue, Parkinson's symptoms.
Treatment: Correct metabolic stress due to nutrient insufficiencies, L-Dopa, Antidepressants (Wellbutrin), Decrease stress (Cortisol) - emotional & physical. Supplement with Vitamins B2, B3, B6, B12, Folate, methylation agent (DMG or TMG or SAMe), elements Mo and Fe and Magnesium.
Both HVA (Dopamine metabolite) & VMA (Adrenergic metabolite) will often be low due to the same pathway being used. Supplementation with tyrosine and/or phenylalanine may improve levels.

Serotonergic Activity Comment

ELEVATED 5HIAA LEVEL:
(Serotonin Catabolism)

An excess of serotonin can cause panic attacks. These can be controlled by serotonin agonists.

Causes:
Slight increase in levels may be due to tryptophan or 5HTP supplementation or medication.
Abnormally high levels of this serotonin metabolite can result from the use of SSRI drugs (selective serotonin re-uptake inhibitors) or the release of serotonin from any 3 primary sites: Central nervous system, Argentiffin cells in the gut, or platelets.
Increased release of serotonin from 3 specific sites: CNS, Intestinal argentaffin cells, Platelets.
Carcinoid tumours composed of chromaffin tissue can also release large amounts of serotonin.
Drugs which may have an adverse effect: Prozac, Resperine.

Symptoms & Conditions:
Chronic elevation can deplete tryptophan, depression, Stunned growth.

Xylene Exposure			
3,4-Dimethylhippurate	*2.00* *H	0.00 - 0.11	ug/dg CR
3-Methylhippurate	*1.00* *H	0.00 - 0.23	ug/dg CR
2-Methylhippurate	1.00	0.00 - 7.20	ug/dg CR

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Xylene Exposure Comment

Xylene:
Found in many solvents (paints, perfumes, etc.). Used in insecticide\pesticide application. Metabolized to Methylhippurate, which is measured in urine.
Xylene Metabolites (2-Methylhippurate or 3-Methylhippurate) Comment:
SOURCES OF EXPOSURE
Mainly by inhalation of vapors.
Natural component of petroleum and coal tar.
Motor and aviation fuel additive.
Automotive emissions, poor emission-control devices on older vehicles, poor maintenance practices, aviation fuel, waste and landfill sites, localized industrial discharges and spillage incidents, tobacco smoke.
Topical contact or inhalation of: varnish/polishers, paint, paint thinner, paint remover, shellac, rust preventatives, lacquers, inks, dyes, adhesives, cleaning fluids, degreasing agents, household cleaning products.
Used as a solvent for rubbers, synthetic resins, gums, inks, paint.
Fabric and leather treatments.
Used in the synthesis of plasticizers and in the manufacture of polyester fiber, film, insecticide formulations, and perfumes.
Occupational Exposure: paint and printing ink industries, automobile body and related repairers, photographic processing, rubber, leather, plastics and textile industries, flooring contractor.

EFFECTS
Depression of the central nervous system.
Neuropsychological and neurophysiological dysfunction.
Anemia, thrombocytopaenia, renal damage.
Irritation of mucous membranes, dermatitis, nausea, fatigue, headache, anxiety.
Dyspnea, cyanosis.

METABOLISM
Xylene is metabolized in the liver by cytochrome P-450-dependent multifunction oxidase enzymes, conjugated principally with glycine
and excreted in the urine as methylhippuric acids.
Conjugation with sulfate or glucuronic acid represents a minor pathway.
Urinary levels of 2, and 3-methylhippurate provide a valid complement to ambient monitoring. Although the 2-isomer exhibits a
longer half-life, the 3-isomer is the principle component making up 45-70% of co
Trimethylbenzene Metabolite (3,4-Dimethylhippurate) Comment:
SOURCES OF EXPOSURE
Mainly by inhalation of vapors.
Production occurs during petroleum refining.
Primary use is as a motor fuel additive.
Automotive emissions, poor emission-control devices on older vehicles, poor maintenance practices, diesel engine exhaust.
Solvent in coatings, paint thinners, wood preservatives, cleaners, dry cleaners, degreasers, aerosols, pesticides, printing and inks.
Component of white spirit, the most widely used solvent in the paint and coating industry.
Manufacture of pharmaceuticals, asphalt products, lacquers, varnishes, dyes, perfumes.
Occupational Exposure: scientific labs, janitors/cleaners, dry cleaning industry, automobile body and related repairers, construction laborers, house painters, screen cleaning processes, ski boots finishing, and telephone cable assembly.
People who do considerable home maintenance work or hobby work may be exposed via inhalation or dermal contact with the solvent.

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EFFECTS
Irritation of mucous membranes, dermatitis, dizziness, " d runkenness " , fatigue, headache, anxiety, nervousness.
Cyanosis, cognitive and motor impairment, apnea, bursts of perspiration, cardiac arrest.
Diarrhea, abdominal pains, nausea, blurred vision.
Low frustration tolerance, lack of initiative, apathy, depression, irritability (painter ' s syndrome) .
Neurotoxic.
Decreased erythrocyte, leukocyte and platelet counts.
Carcinogenic
Glomerulonephritis, renal dysfunction.

METABOLISM
Metabolized in the liver by cytochrome P-450 dependent multifunction oxidase enzymes, conjugated with glucuronic acid, glycine, or sulfates for urinary excretion.
Lipophilic and may accumulate in fat and fatty tissues.

Toluene Exposure

Hippurate	**4.0**	0.0 - 663	ug/mgCR	
Benzoate	***3.00* *H**	0.00 - 0.41	ug/mgCR	

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Toluene Exposure Comment

Toluene:
Found in paints, glues, sanitizing agents, cigarette smoke.
Benzoate is metabolized to Hippurate. Elevations may cause elevated Hippurate independent of Toluene.
Toluene Metabolite (Hippurate) Comment:
SOURCES OF EXPOSURE
Mainly by inhalation of vapors. Produced from petroleum refining.
Automotive and aircraft emissions, poor emission-control devices on older vehicles, poor maintenance practices, high-density traffic locales, gasoline filling stations, refineries, tobacco smoke. The amount of toluene in a single cigarette may vary from 80 to 100 micrograms (?g) .
Blended into gasoline as a component to increase octane number.
Two thirds of its use as a solvent carrier in paints, inks, thinners, coatings, adhesives, degreasers, pharmaceutical products.
Household aerosols, spray paint cans, glues, varnishes, shellac, rust preventatives, solvent-based sanitizing agents and germicides, etc.
Additive in cosmetic products.
Occupational Exposure: paint, printing and leather finishing-industry, rubbercoating industry, shoemakers.
***Hippurate is also the end product of benzoate metabolism. Benzoate may be derived from foods containing sodium benzoate additive.**

EFFECTS
Depression or excitatory effect on the central nervous system -
euphoria followed by disorientation, tremulousness, mood lability, tinnitus, diplopia, hallucinations, dysarthria, ataxia, convulsions,
coma.
Irritation (eyes, nose, throat) , dizziness, taste and olfactory fatigue.
Drowsiness, headache, impaired cognitive and motor function, insomnia, anorexia.
Solvent abuse through " sniffing " toluene -containing products may lead to gross disorientation, neurological impairment and death.

METABOLISM
Toluene is metabolized in the liver by cytochrome P-450 dependent multifunction oxidase enzymes conjugated principally with glycine,
and excreted in the urine as hippuric acid.
Smaller amounts may be conjugated with glucuronic acid. Minor amou
An elevated reading of Benzoate may mean an overgrowth of certain intestinal microbiota, ingestions of excessive benzoic acid in the diet (preserved foods, pickles, lunch meats, cranberries), or poor Phase II detoxification capabilities as the conjugation of benzoate with glycine generally is very efficient. The presence of this compound may be due to the action of the bacteria on phenylalanine. Assessement of amino acid competency may be helpful especially plasma glycine.

BENZENE EXPOSURE.

t,t-Muconic Acid	***2.00* *H**	0.00 - 0.11	ug/dg CR

Trimethylbenzene Exposure

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Benzene Exposure Comment

Benzene Metabolite (Trans, trans-muconic acid) Comment:
Sources of Exposure
Natural component of crude and refined petroleum.
Automotive emissions, poor emission-control devices on older vehicles, poor maintenance practices, automotive-refueling operations and industrial emissions.
Emissions during the production of xylene, toluene, styrene and other compounds.
Discharge of industrial wastewater from chemical plants, chemical manufacturing sites, and petrochemical and petroleum industries.
Seepage from underground petroleum storage tanks, waste streams.
By-product of various combustion processes - wood burning, organic wastes, tobacco smoke.
First and second-hand smoke accounts for the largest source of benzene exposure for the general public. The amount of benzene in a single cigarette may vary from 5.9-90 micrograms.
Used in the manufacture of Styrofoam, resins, synthetic fibers and rubbers, gums, lubricants, dyes, glues, paints, and marking pens.
Used as a solvent in scientific labs, industrial paints, adhesives, paint removers/strippers, degreasing agents, carburetor cleaner, rubber cements, some arts and crafts supplies, manufacture of faux leather and rubber goods.
Off-gassing from building material, particleboard, carpet glue, textured carpet, liquid detergent, furniture wax, structural fires, high-density traffic locales, petrol stations.

Occupational Exposure: industries that produce or use benzene or benzenecontaining products - oil refineries, petroleum plants, tire manufacturers, paint and shoe manufacturing plant, petrol stations, active or passive cigarette-smoke inhalation, and areas of heavy vehicular traffic.
Interfering Factors: Sorbic acid and potassium sorbate, common food preservatives, are metabolized to muconic acid, wh

Styrene Exposure

Mandelate	***1.00* *H**	0.00 - 0.31	ug/dg CR
Phenylglyoxylate	**0.20**	0.00 - 0.40	ug/dg CR
Mandelate + Phenylglyoxylate	***10.00* *H**	0.00 - 0.64	ug/dg CR

Styrene Exposure Comment

Styrene:
Used in the manufacturing of rubber, latex, and plastic products
Found in carpet backing, packaging materials, foam cups, etc. Central Nervous System depressant. Genotoxic. Metabolized to Phenylglyoxylate and Mandelate. Exposure best correlates to the sum of the two metabolites.

Phthalate Exposure

Monoethyl Phthalate	***12.00* *H**	0.00 - 0.09	ug/dg CR
Phthalic Acid	***4.00* *H**	0.00 - 0.50	ug/dg CR
Quinolinate	**5.00**	0.00 - 6.10	ug/mgCR

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Phthalate Exposure Comment

Phthalic Acid Ester Metabolite (Phthalate):
SOURCES OF EXPOSURE
Used in the manufacture of plastics to soften resins and impart flexibility. Most widely used plasticizers for the manufacture of polyvinyl chloride (P VC) plastics utilized in vinyl flooring and tile, wall covering, pool liners, tool handles, insulation of wires and cables, garden hoses, construction materials, weather-stripping, canvas tarps, upholstery, some food wrappersand containers, medical equipment containing flexible plastics such as blood bags and tubing, haemodialysis, children ' s toys, dishwasher baskets, notebook covers, flea collars, faux leather, shoe soles, traffic cones, latex adhesives, dyes, some pharmaceutical and pesticide formulations.
Detergents, lubricating oils, automobile parts, automobile undercoating, carpet backing, solvents, and personal-care products such as soaps, shampoo, hair spray, nail polish, and toothbrushes, baby-care products.
Diethyl Phthalate (parent compound of MEP) reported in over 70% of cosmetic products tested. Make fragrance in cosmetics and household products last longer.
Occupational Exposure: Plasticizer and PVC processing plants.
***Quinolinate - Phthalate esters perturb tryptophan metabolism resulting in the accumulation of quinolinic acid, an endogenous excitotoxin implicated in inflammatory neurological disorders.**
***Quinolinate is a metabolite of the essential amino acid tryptophan in the kynurenine pathway. This pathway is chiefly activated by IFN -gamma and IFN -alpha. Quinolinate is markedly elevated in the CNS following trauma or inflammation, and is implicated in neuronal injury through activation of the Nmethyl- D-aspartate (NMDA) receptor.**
Toxicity of phthalate esters, acting as metabolic disrupters, through accumulation o
PHTHALATE:
Used as 'plasticizers' to make plastics flexible. Found in 2\3 of cosmetic products. Also found in time-released drugs and pesticide formulations. Known endocrine disruptors. Linked to male fertility problems. May increase the production of Quinolinate, which plays a role in inflammatory disorders. Shown to have Genotoxic potential in lymphocytes.

HVA/5HIAA Ratio	**0.1**	0.0 - 1.2	RATIO

Urban Pollution Index

Urban Pollution Comment

URBAN POLLUTION INDEX:
Research has showed that increased exposure to urban-type pollution increases levels of HVA and decreases 5-HIAA.
Looking at the ratio of HVA:5-HIAA may help in assessing one's overall exposure to pollution in general.

Tests ordered: EPoll