EXPOSURE TO NEPHROTOXINS

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A nephrotoxin is any substance that causes injury to the kidneys. The mammalian kidney is an extremely complex organ, both anatomically and functionally. In addition to the excretion of wastes, the kidney plays a significant role in the regulation of total body homeostasis; it is the predominant organ involved in regulation of extracellular fluid (ECF) volume and electrolyte composition. The kidney also is a major site of formation of hormones that influence systemic metabolic functions, including erythropietine, 1,25-dihydroxy-vitamin D_3, rennin, and several vasoactive prostanoids and kinins. A toxicological insult to the kidney could affect any or all of these functions. However, the effects usually reported following toxic insult reflect decreased elimination of wastes, that is, an increase in blood urea nitrogen (BUN) or an increase in plasma creatinine. This does not necessarily mean that excretory functions are primarily affected by nephrotoxicants; rather, these are renal functions that are measured rapidly and reliably. Thus, the use of BUN and plasma creatinine as clinical indices of nephrotoxicity reflects the state of technology, not necessarily the primary sites of nephrotoxicity.

Specific Nephrotoxicants

As indicated above, not all compounds that influence renal function affect the kidney directly. Renal function may be altered secondarily to changes in blood pressure, blood volume, or neural or hormonal influences and to a variety of destructive systemic effects. A focus will be on compounds that produce specific effects on the kidney. Many of these agents affect the kidney directly. In other cases, the ultimate toxicant might be a metabolic product formed within the kidney or produced in an external organ and transported to the kidney where it acts directly or requires further metabolism to a nephrotoxic product. (See Table 1.1) Some of these types of compounds are listed be low and are not limited to:

Heavy Metals - mercury, cadmium, chromium, arsenic, gold, lead, iron, antimony, uranium, lead, zinc, nickel, and thallium.

Halogenated Hydrocarbons – chloroform,bromobenzene, hexachlorobutadiene, petroleum hyrdrocarbons.

Therapeutic Agents – microbivores, nanocomposites, analgesics, anesthetics, antibiotics/antivirals, antifungals, , cephalosporins, tetracyclines, demeclocycline, Amphotericine B, antineoplastic agents (cisplatine)

Immunosuppressants – cyclosporine and others

Environmental Contaminants - herbicides, pesticides, hazardous wastes, substances, Chem Trails residues, fungicides, biological and chemical agents, advanced nano materials and biomaterials (microbivores), botanicals, mycotoxins, organic solvents, experimental tools/miscellaneous polymers.

General Information on Kidney Disease (Failure)

Kidneys remove waste products form the body, keep body chemicals in balance, and help maintain the body's water balance. There are a number of different renal (kidney) problems that may occur. The kidneys may be damaged by exposure to certain drugs or toxins, including heavy metals, solvents, chemotherapy agents, snake or insect venom, poisonous mushrooms, and pesticides. Renal failure can also accompany or result from many other disorders, such as congestive heart failure, diabetes, chronic hypertension, liver disease, lupus, and sickle-cell anemia.

Bright's disease is a kidney disease marked by the presence of blood protein in the urine, along with hypertension and edema (retention of water in the tissues), Glomerulonephritis is an inflammation of tiny blood vessels within the kidney that filter out wastes from the blood. This may occur as a result of an immunological response to infection (severe septicemia), which may be triggered by exposure to microorganisms (pathogens), microbivores (urine bubbles), hazaradous materials, venoms, mycotoxins, endotoxins, exotoxins, and many other toxic substances. In some cases of microbivores (bacterophage/nanorobotics) the immune system does not respond at all. If a true infectious material, such as Streptococcus throat infection, it can have an affect upon the kidney. Pyeloneophritis is a kidney infection that may be caused by a birth defect. Both glomerulonephritis and pyelonephritis can be chronic or acute, and can be serious. *Hydronephrosis* is a condition in which the kidney and the renal pelvis (the structure into which urine is discharged from the kidney) become filled with urine due to an obstruction of urinary flow. *Polycystic kidney disease* (PKD) is stated as being an inherited disease in which cysts grow on the kidneys as balloons. This ballooning effect may be the direct cause of environmental pollutants being stuck within the nephrons (filters) of the kidney and ballooning in the area. Cysts are formed from the death of the white blood cells responding to a particular infectious material or hazardous material (such as heavy metal). The cysts grow on the kidneys, rendering them incapable of functioning. Kidney stones are mineral accumulations (primarily calcium) in the kidneys. In renal tubular acidosis, the kidneys fail to reabsorb bicarbonate normally, causing impaired ammonia production and acid excretion. Severe acidosis, potassium depletion, and bone disorders may result. Nephrotic syndrome is not a disease itself, but can be a sign of kidney disease. It is marked by edema and excess protein in the urine. It can be caused by lesions of glomeruli (small structures in the kidney made of capillaries) that become inflamed, or by chronic diseases such as diabetes or lupus.

One important symptom of kidney problems is edema. Edema results when the kidneys produce less urine because they are unable to properly excrete salt and other wastes, and fluid builds up in the body. Ankles and hands may swell, and the person becomes short of breath. Toxic wastes may accumulate in the blood stream due to kidney malfunction, a condition known as uremia. Symptoms of kidney problems included abdominal pain, appetite loss, back pain, chills, fever, fluid retention (bloating), nausea, urinary urgency, and vomiting. The urine may be cloudy, bloody, or bubbles (microbivores). Back pain may be sudden and intense, occurring just above the waist and running down the groin.

Nutrients

The following supplements aid in controlling urinary tract infection, exposure to hazardous materials and other related toxins to help maintain proper kidney function. Unless otherwise specified, the dosages recommended here are for adults. For a child between the ages of twelve and seventeen, reduce the dose to three-quarters of the recommended amount. For a child between six and twelve, use one-half of the recommended dose, and for a child under the age of six, use one-quarter of the recommended amount.

Supplement	Suggested Dosage	Comments
Acidophilus	As directed on label, 3 times daily. Take on an empty stomach.	Especially important if antibiotics.
Coenzyme A	As directed on label.	Acts as an antioxidant & removes harmful substances from the body.
Restorex Complex	As directed on the label, 3 times daily.	Aids in building cellular compounds.
Vitamin B_6	Pain, 500 mg/day 50 mg, 4 times/day	To reduce fluid retention
Choline	50 mg daily	
Inositol (IP_6)	100 mg daily	
Vitamin C with Bioflaonoids	2,000 – 4,000 mg daily	Acidifies the urine, boosts immune function, and aids in cell membrane healing
Calcium & Magnesium	As directed on bottle, "Calm" 1,500 mg daily (Ca) 750 mg (magnesium) daily	For proper mineral balance; calcium and magnesium should be in a 2 to 1 ratio
L-Arginine And L-methionine	500 mg, 4 times day As directed on label, on an empty Stomach. Take with water or juice. Do Not take with milk. Take with 50 mg Vitamin B_6 and 100 mg Vitamin C for better absorption.	For kidney disease For improved kidney circulation
Lecithin granules or Capsules	1 tbsp. 3 times daily 2,400 mg or IU's, 3 times a day before meals	Needed for nephritis.

SUPPLEMENT	DIRECTIONS	COMMENTS
Digestive-Ease	As directed on bottle	Necessary for digestion
Apple cider vinegar but prefer Pineapple Vinegar 1 teaspoon in a glass of water ½ hour before meals.		
Multi Vitamin or VIBE	As directed on bottle	Necessary for cellular support.
VermiiZyme	As directed on bottle	Necessary for mitochondria Support.
Griminex	As directed on bottle	Hormonal support.
Nettles, herb leaves and roots	As directed on bottle	Kidney & bladder cellular repair
Vitamin A with With Mixed carotenoids	100,000 IU daily for 3 days then 50,000 IU daily for 5 days, then reduce to 25,000 IU Daily. If you are pregnant, do not Exceed 10,000 IU daily.	Important in healing of urinary tract lining and in immune function. Use emulsion form for easier assimilation and greater safety at high doses. D0 not take this amount in pill form. (soft gels – emulsion)
Vitamin B Complex	100 mg of each major B vitamin daily (amounts of Individual vitamins	B vitamins work best when taken together. Use a high potency formula.
Plus extra Vitamin B_2	in a complex will vary) 25 mg 3 times daily.	Needed for nephritis.
1 Tablespoon Olive Oil or Vitamin E emulsion or capsules	800 IU daily. start with 200 IU daily and gradually and increase to 1,000 IU daily	Promotes immune function. An important free radical. destroyer. Use d-alpha- tocopherol form.
Zinc Plus Copper	50 – 80 mg daily. Do not Exceed 100 mg daily From all supplements for SOD-1 utilization 3 mg daily.	An immunostimulant necessary for healing and an important inhibitor of crystallization and Crystal growth. Use zinc gluconate lozengers or Coldezze, Opti Zinc for best Absorption
Zinc & Copper may be substituted with LipoSOD	As directed on bottle	SOD Supplement & Potent Anti-Oxidant Nutrient Repair And support formula.

Phase 2/L-Carnitine with SX-Fraction	As directed on Bottle	Phase II Liver Detox
Super Tremella	As directed on Bottle	Nourishes the lung, stomach & Kidney

During the first 0 – 30 days (one month) it may be difficult to adjust to the changes for your body. One must remember that the condition that has expressed itself as chronic effect from nephrotoxins may have taken years to create. Commitment to healing your kidney and body is necessary. Nothing is easy when you are making changes out of CHAOS within the cell. Cellular dysfunction, injury and death are the cellular global mechanisms to create disease within a living life system.

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TABLE 1.1: EXAMPLES OF OCCUPATIONAL/ENVIRONMENTAL AND EXPERIMENTAL NEPHROTOXICANTS*

(*Taken from Chapter 11: Toxic Responses of the Kidney, page 376 by William R. Hewitt, Robin S. Goldstein, and Jerry B. Hook. Casarett and Doull's Toxicology: The Basic Science of Poisons, 4th Edition. Mary O. Amdur, Ph.D., John Doull, Ph.D, M.D., and Curtis D. Klaassen, Ph.D. Pergamon Press. New York © 1991) and relative referenced internet listings of research archives.*

TOXICANT	REFERENCE
Mycotoxins/kBotanicals	Bermdt. 1987
Aflatoxin B	
Citrinin	
Ochratoxin A	
Monocrotalin	
Pyroolizidine alkaloids	
Rubratoxin B	
Halogenated Aliphatic Hydrocarbons	Lock, 1988; Kluwe, 1990
Bromobenzene	
Bromodichloromethane	
Carbon tetrachloride	
Chloroform	
Chlorotrifluoroethylene	
Dibromochloropropane	
Dichloroethane	
Hexachlorobutadiene	
Pentachloroethane	
Trichloroethylene	
Tetrachloroethylene	
Tetrafluoroethylene	
Tris (2,3-dibromopropyl)-phosphate	
Volatile Hydrocarbons	Alden, et al, 1984
Petroleum fuels	Swenberg, et al. 1989
Metals	
Cadmium	Fowler, et al, 1987
Gold	Wedeen, 1988
Lead	
Mercury	
Nickel	
Chromium	
Uranium	
Strontium-90	Staninger, 2009
Herbicides/Fungicides	Ecker et al, 1975
Paraquat	Berndt, 1982a
Diquat	Rankin et al, 1989
Sussinimides	
1,4,5-Trichlorophenoxyacetate	

Table 1.1 continued

TOXICANT	REFERENCE
Organic Solvents	Gosselin et al, 1984
Ethylene glycol	
Diethylene glycol	
Toluene	
Experimental Tools/Miscellaneous	
p-Aminophenol	Newton et al, 1982
Adrimaycin	Elema, et al, 1988
Benzidine	Zenser and Davis, in press
Bromoethanamine hydrobromide	Sabatini, 1988
d-Serine	Carone and Ganote, 1975
d-Lysine	Racusen, et al, 1985
Limonene	Lehman-McKeeman et al, 1989
Maleic acid	Berliner et al, 1950
Microbivores & Nanorobots	Staninger, 2008 in press
Modified Food Starch (Waterborne polyurethane)	Staninger, 2009
Nano tubes, gels, & composites	Staninger, 2006, 2007
Phenylanthranillic acid	Bach and Gregg, 1988
Puromycin aminonecleoside	Elema et al., 1988

* Only agents that have a direct effect on the nephron are cited. Examples represent some, not all, commonly cited nephrotoxicants.