

TABLE 8.1 — LABORATORY TESTS TO MEASURE TOXIN EXPOSURE, REMOVAL AND PROTECTION

Assessment of exposure or effects				
Exposure	Test	Result	Meaning	Interventions
Heavy metals	Toxic metals – blood, urine or hair	High	Increased body burden	Reduce exposure; oral and I.V. chelation: Protective nutrients
	Oral cavity mercury vapor	High	Dental amalgam mercury release	Replace dental fillings; I.V. chelation: Nutrient support
Environmental organotoxins	Organic toxins – blood	High	Recent exposure	Reduce exposure; detoxification protocols: Hepatic detoxification nutrient support
	Metabolites – urine	High	Recent exposure or recent mobilization	As above plus assess treatment aggressiveness
Intestinal microbial toxins	Microbial products – urine	High	Intestinal microbial overgrowth	Restore microbial balance (see Chapter 7)
Various	Porphyrias	Specific analytes high	Enzyme inhibitions	Direct testing to verify toxicant levels, body burden reduction and tolerance improvement

Assessment of Detoxification Capacity					
Mechanism	Test	Result	Meaning	Associations	Interventions
Oxygen radical quenching	Lipid peroxides – serum or urine	High	Antioxidant insufficiency	Low serum antioxidants	Fat-soluble antioxidants
	8-Hydroxy-2'-deoxyguanosine	High	Antioxidant insufficiency	Low serum antioxidants	Water-soluble antioxidants
Ammonia clearance	Orotate – urine	High	Ammonemia	Dysbiosis, urea cycle inefficiency	L-Arginine, α -KG, Mg, Mn
	Citrate – urine	High	Ammonemia	Dysbiosis, renal ammonia clearance	L-Arginine, α -KG, Mg, Mn
Phase I Bio-transformation	Glucaric acid – urine	High	Phase I & II induction	Stimulation of hepatic oxidation and conjugation	Reduce toxin load and use support nutrients
	Caffeine clearance – saliva	Low	Low Phase I, slow P450 pathway	Amphetamines, cimetidine, isoniazid, oral contraceptives	Lipoic acid and other hepatic-protective nutrients
	Caffeine clearance – saliva	High	P450 induction	Toxin exposure	Antioxidant protection
Phase II Bio-transformation	Salicylic acid or acetaminophen mercapturate, sulfate, and glucuronide – urine	Low	Low Phase II oxidation	Low cysteine, glutathione, and related nutrients	N-Acetylcysteine, taurine, NaSO ₄
– Sulfoxidation	Cys/Sulfate ratio	High	Impaired sulfoxidation	Neurological disorders	Mo, Cu, Fe, and MgSO ₄ (IV)
	Cysteine – plasma	High	Impaired sulfoxidation	Excessive Cys	Mo, Cu, Fe, and MgSO ₄ (IV)
– Sulfation	Sulfate – plasma or urine	Low	Low Phase II sulfation	Glutathione and sulfate deficiency	N-Acetylcysteine, MgSO ₄ (IV) Use Cys with care
– Glucuronidation	Bilirubin (indirect) – serum	High	Low glucuronidation	Slow drug clearance	Lower drug dosing
– Glycine conjugation	Benzoate – urine	High	Low glycine conjugation	Glycine depletion	Glycine, Vitamin B ₅
Phase I/Phase II	Hepatic Phase I/Phase II ratio	High	Increased risk of carcinogenesis	Deficiencies of conjugation cofactors	N-Acetylcysteine, glycine, Vitamin B ₅ , antioxidants

Table 8.1 continued on following page...