**Gut Health & Detoxification**

**Nutrients Supporting The Gastrointestinal System**

**Pancreas**
- Pancreatic juices contain digestive enzymes that become active once in the duodenum.
- **Nutrients**
  - Pancreatin (pancreatic enzymes containing protease, lipase and amylase)
  - Bromelain
  - Trypsin

**Stomach**
- Secretes gastric juice and hydrochloric acid
- Requires a pH of 1.5 to 3.5
- Breaks down food
- Defence against pathogens
- **Nutrients**
  - Betaine hydrochloride
  - Glutamine
  - Zinc
  - Pepsin
  - Ginger
  - Gentian

**Small Intestine**
- Duodenum mostly responsible for digestion of food - with digestive enzymes from the pancreas and bile from the liver. Jejunum and ileum mainly responsible for nutrient absorption.

**Large Intestine & Intestinal Lining**
- Nutrient absorption
- Protects body from toxins passing directly into the bloodstream
- **Nutrients**
  - Glutamine
  - Slippery Elm
  - Pectin
  - Saccharomyces cerevisiae (Boulardii)

**Normal Flora**
- Aids digestion
- Immune support
- Helps produce some B Vitamins and Vitamin K
- **Nutrients**
  - Probiotics

**Intestinal Pathogens**
- Reduce intestinal function
- Compete for nutrients
- **Herbs**
  - Citrus seed
  - Garlic
  - Wormwood
  - Black Walnut
  - Barberry
  - Oregano oil
  - Thyme oil
  - Pau d’arco
  - Rosemary oil

**Steps to Detoxification**

**STEP 1**
Detox Primer
1-2 weeks
Preparation stage to reduce adverse effects of detoxification reactions PRIOR to starting a detoxification program.

**STEP 2**
Detoxification Program
Restore gut ecology
2-4 weeks
Remove excess adverse pathogens whilst preserving beneficial bacteria.

**STEP 3**
Detoxification Program
Gut repair and liver detoxification
2-4 weeks (or as long as needed)
Repair mucosal integrity and facilitate liver detoxification.

**STEP 4**
Removal of Toxins
2-4 weeks (or as long as required)
Support the removal of toxins produced during Phase II and III, via the kidneys, to be excreted through bile produced in the liver.

**STEP 5**
Remove Heavy Metal / Toxic Burden
3-12 months (or as required)
Support the removal of heavy metals and chelation processes. If heavy metal exposure is suspected chelation should commence from Step 2.

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The Detoxification Process

Nutrients Supporting The Liver, Kidneys & Bladder

Detoxification Phases

Phase I
- Cytochrome P450 enzymes modify toxins to produce reactive intermediate metabolites (free radicals)

Phase II
- Detoxify intermediate metabolites from Phase I so they can be excreted from the body
- Six conjugation reactions:
  - Methylation
  - Glucuronidation
  - Sulfation
  - Acetylation
  - Glutathione conjugation
  - Amino acid conjugation

Phase III
- Reduces toxic load within the small intestine and supports elimination of xenobiotics prior to Phase I detoxification
- Transportation of conjugated metabolites after Phase II detoxification

Liver

Nutrients for Phase I/Intermediate Metabolites
- B Vitamins
- Bilberry
- Grape Seed
- Vitamin C
- Selenium
- Broccoli Sprout
- Manganese
- Garlic

Nutrients for Phase II
- Glycine
- Glutamine
- Methionine
- Magnesium
- Inositol
- Taurine
- Cysteine
- Brown Rice
- Choline
- Parsley
- Maritime Pine Bark

Nutrients for Phase III
- Calcium-d-glucarate
- Gluconolactone
- Broccoli sprout
- Maritime Pine Bark
- Glutathione

Kidneys & Bladder

Nutrients for Toxin Removal
- Chromium
- Selenium
- Zinc
- Vitamin C
- Molybdenum

Large Intestine

Nutrients for Toxin Removal
- Glutamine
- Slippery Elm
- Pectin
- Saccharomyces cerevisiae (Boulardii)

Toxins
- Alcohol
- Drugs and medications
- Preservatives and additives
- Pesticides
- Micro-organisms
- Cigarette smoke
- Compounds in barbecued meat
- Heavy metals

Toxins released from tissues into the blood are then excreted via kidneys and bladder.

Some toxins are transported in bile and sent to the gallbladder for storage. Back in the duodenum, the toxins pass through the digestive tract and are eliminated in the stool as waste.

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