



# LOVE YOUR LIVER AND IT WILL LOVE YOU

## CLASS OUTLINE

- ❖ Western Physiologic View
- ❖ Stressors on the Liver
- ❖ Traditional Chinese Medicine View
- ❖ Foods to Support Liver Health
- ❖ Herb to Support the Liver
- ❖ Detoxification Guidelines

## IMPRESSIVE STATS

- ❖ Largest and heaviest internal organ/gland
- ❖ Produces 1 liter of bile per day
- ❖ Filters 2 liters of blood per minute
- ❖ 500+ functions within the body
- ❖ Can regenerate itself



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## WESTERN PHYSIOLOGIC VIEW

### Multi-organ system

- ❖ Digestion
  - Filtration of blood
  - Stores blood sugar as glycogen and triglycerides
  - Produces cholesterol
  - Stores fat-soluble vitamins: A, D, E, K
  - Stores minerals: iron (as ferritin), copper, zinc, potassium
  - Bile production: emulsification/digestion of fats, assists in the absorption of the fat-soluble vitamins, lubricates feces, promotes peristalsis and is antibacterial
- ❖ Immune
  - Aids in Vitamin D conversion
  - Filters out bacteria
  - Produces natural anti-histamines (Yakriton), useful in the treatment of allergies, nasal congestions and asthma
- ❖ Endocrine
  - Regulates thyroid function by converting T4 (thyroxine) to T3 (triiodothyronine)
  - Breaks down or metabolizes hormones: estrogen, testosterone, cortisol, adrenaline, insulin
  - Women have a larger liver proportionally than men

**YOUR FIRST WEALTH IS HEALTH**

2415 Hennepin Avenue South, Minneapolis, MN 55405

612 872 9133 / Fax 612 872 0342

[diamondstoneom.com](http://diamondstoneom.com) / [katherine@diamondstoneom.com](mailto:katherine@diamondstoneom.com)

## Phase I *Cytochrome P450 Enzymes*

- ❖ Breaks things down – Subtraction 
  - Toxins are chemically transformed into a less toxic form, made into a water- soluble form or converted to a more chemically active form
  - Free radical generation a byproduct of detoxification: 1 for 1
  - Activity of enzymes varies from one person to another depending on genetics, exposure to toxins and nutritional status

- ❖ Nutrients needed to support Phase I Detoxification Enzymes
  - B Vitamins, magnesium, iron, brassicas/cruciferous vegetables (indole-3-carbinols), copper, zinc, Vitamin C

- ❖ Activators of Phase I Detoxification Enzymes

|               |  |
|---------------|--|
| Drugs         | Caffeine, alcohol, nicotine from cigarette smoke, phenobarbital, sulfonamides, steroids  |
| Foods         | Cabbage, broccoli and Brussels sprouts, charcoal-broiled meats, high-protein diet; oranges and tangerines (but not grapefruit) |
| Herbs         | Caraway and dill seeds   |
| Environmental |  |
| Toxins        | Carbon tetrachloride, exhaust fumes, paint fumes, dioxin, pesticides   |

- ❖ Inhibitors of Phase I Detoxification Enzymes

|       |  |
|-------|--|
| Drugs | Benzodiazepines, antihistamines, cimetidine and other stomach-acid blocking drugs, ketoconazole, sulfaphenazole  |
| Foods | Grapefruit: contains naringenin, 8 oz of grapefruit juice decreases Phase I detoxification by 30%!<br>Turmeric: curcumin inhibits Phase I, but stimulates Phase II<br>Useful in preventing certain types of cancer, it inhibits the activation of carcinogens while increasing the detoxification of those that are activated. <i>For example: most of the cancer-producing chemicals in cigarette smoke are only carcinogenic during the time between activation in Phase I and the completion of detoxification in Phase II.</i> |
| Herbs | Eugenol from cloves, Capsaicin from <i>Capsicum frutescens</i><br><i>Calendula officianalis</i>  |
| Other | Aging: Lack of physical exercise, decreased blood flow, poor nutrition<br>Non-beneficial bacteria in gut   |

- ❖ Caffeine is directly neutralized by Phase I detoxification
  - Its detoxification uses up powerful antioxidants that are required by Phase II detox.

## Phase II *Conjugation*

- ❖ “Special substances” added 
  - Makes the toxin or metabolite easier to transport, more stable or more functional
  - End product is water soluble for excretion through the kidneys or bile/feces
  - Six different pathways
  
- ❖ Nutrients needed to support Phase II Detoxification Enzymes
  - Glutathione conjugation:** Glutathione Precursors (Cysteine, Glycine, Glutamic Acid, and co-factors), Essential Fatty Acids (Black Currant Seed Oil, Flax Seed Oil, EPA)
  - Amino acid conjugation:** Glycine
  - Methylation:** Methionine, Co-factors (Magnesium, Folic Acid, B-12, Methyl Donors)
  - Sulfation:** Molybdenum, Cysteine and precursor (Methionine), Co-factors (B-12, Folic Acid, Methyl Donors, Magnesium), MSM
  - Acetylation:** Acetyl-CoA, Molybdenum, Iron, Niacinamide, B-2
  - Glucuronidation:** Glucuronic acid, Magnesium
  
- ❖ Activators of Phase II Detoxification Enzymes
  - Glutathione conjugation:** Brassica family foods (cabbage, broccoli, Brussels sprouts); limonene-containing foods (citrus peel, dill weed oil, caraway oil)
  - Amino acid conjugation:** Glycine
  - Methylation:** Lipotropic nutrients (choline, methionine, betaine, folic acid, vitamin B<sub>12</sub>)
  - Sulfation:** Cysteine, methionine, taurine
  - Acetylation:** None found
  - Glucuronidation:** Fish oils, cigarette smoking, birth control pills, Phenobarbital, limonene-containing foods
  
- ❖ Inhibitors of Phase II Detoxification Enzymes
  - Glutathione conjugation:** Selenium deficiency, vitamin B<sub>2</sub> deficiency, glutathione deficiency, zinc deficiency
  - Amino acid conjugation:** Low protein diet
  - Methylation:** Folic acid or vitamin B<sub>12</sub> deficiency
  - Sulfation:** Non-steroidal anti-inflammatory drugs (e.g. aspirin), tartrazine (yellow food dye), molybdenum deficiency
  - Acetylation:** Vitamin B<sub>2</sub>, B<sub>5</sub>, or C deficiency
  - Glucuronidation:** Aspirin, probenecid

# STRESSORS ON THE LIVER

## Obvious list

- ❖ Alcohol
- ❖ Prescription Drugs
  - Statins – diminish CoQ10 by 60%. CoQ10 requires 17 different foods for its production
  - Induce nutrient deficiencies
- ❖ Insecticides
- ❖ Pesticides
- ❖ Food Additives
- ❖ Caffeine
- ❖ Exhaust Fumes
- ❖ Cleaning Products – especially bleach which off gasses dioxin
- ❖ Health and Beauty Products – make up, hair colors and dyes
- ❖ Off Gassing from New Construction and Cars

## Not so obvious list

- ❖ Dysbiotic Gut
  - Bacteria strip the toxins off in the gut during Phase II
  - Low levels of hydrochloric acid lead to incomplete protein digestion and beneficial bacteria aren't able to thrive
- ❖ Hormonal metabolic end products
- ❖ Microorganisms – lingering bacteria, viruses, fungi and parasites
- ❖ Foods
  - High Fructose Corn Syrup (HFCS)
  - Carrageenan – inhibits Phase I detoxification. Found in many milk replacement and dairy products.
  - Hydrogenated oils, trans fats and fried foods
  - Excessive refined carbohydrates (white flour, sugar, etc.)
  - Eating large meals late at night
  - High dairy intake – inhibits cysteine, thus adversely affects glutathione production
  - Nutrient deficiencies – lack of fresh vegetables, fruits and quality protein
  - Glutathione deficiency (an endogenous antioxidant)
    - Most important antioxidant for neutralizing free radicals from Phase I
    - Is needed for the Phase II Glutathione detoxification pathway
    - Requires magnesium for its synthesis
    - Comprised of the amino acids glycine, cysteine, and glutamic acid
    - The liver, kidneys and lungs are rich with glutathione
- ❖ Multiple Chemical Sensitivity (MCS)
  - Over activity of Phase 1 detox, and Phase II can't keep up with the toxic metabolites. Phase 1 inhibitors needed such as grapefruit and turmeric as well as support for Phase II

# TRADITIONAL CHINESE MEDICINE VIEW

- ❖ Simply put: The Liver keeps our qi moving smoothly, stores the blood, controls the tendons and manifests in the nails and opens into the eyes.
- ❖ Chinese Organ Clock: 1-3 am
- ❖ Associations
  1. Tissue: Sinews
  2. Exterior: Nails
  3. Sense Organ: Eyes
  4. Sense Commanded: Vision
  5. Body Fluid: Tears
  6. Portal: Eye Socket
  7. Emotion: Anger
  8. External Evil/Pathogen: Wind (Internal)
  9. Season: Spring
  10. Planet: Jupiter
  11. Tone: A#
  12. Official: General
  13. Official Duty: Planning/flexibility
  14. Taste/Flavor: Sour
  15. Sound: Calling sound
  16. Meat: Chicken
  17. Temperature: Warm
- ❖ Signs of imbalance
  - Feeling stuck/sluggish; irritability, anger, frustration; can't turn mind off at night
  - Gynecological/fertility issues
  - Eyes: inflamed or dry
  - Digestive: stomach pain, rib-side pain
  - Picking at the sides of the fingers/nails
- ❖ Stressors
  - Stress and overwork
  - Long hours spent on the computer
  - Coldness
  - Lack of exercise
  - Overeating
- ❖ Options to soothe the Liver
  - Acupuncture, qigong, tai chi, qi ring, yoga

## FOODS TO SUPPORT LIVER HEALTH

- ❖ Beets and beet greens
- ❖ Brassicas/cruciferous vegetables: kale, collards, cabbage, kohlrabi, Brussels sprouts, cauliflower, arugala, etc.
- ❖ One tablespoon of flax seed (freshly ground) plus one cup of cruciferous vegetables per day to ensure estrogen follows the safe route out of the body
- ❖ Liver
  - Must be from a healthily raised animal
  - Is one of the most nutritionally dense foods in existence. It's the most concentrated source of vitamin A, and it has an abundance of B vitamins, choline, folate, purines, iron and copper.
- ❖ Carrot per day
  - Activates the glucuronidation pathway, works through the GI system, results in endocrine metabolites being eliminated through the bowels.
- ❖ Bone broth – chock full of amino acids. A must read article is on the Weston A. Price website regarding the history of broth consumption (see references).
- ❖ Sulphur-rich foods: garlic, onions, leeks, egg yolks, artichokes
- ❖ Magnesium rich foods – green leafy vegetables, dandelion leaves
- ❖ Limonene from oranges, tangerines and seeds of caraway and dill
- ❖ Berries – blueberries, strawberries, raspberries and cranberries are rich in antioxidants

## HERBS TO SUPPORT THE LIVER

- ❖ Milk Thistle
  - Supports the liver's natural ability to regenerate, can raise the solubility of bile
- ❖ Artichoke
- ❖ Dandelion
- ❖ Burdock
- ❖ Basil – elimination of toxins stored in fat
- ❖ White Peony Root (Bai Shao) – elimination of estrogens
- ❖ Chen Pi (dried tangerine peel) and Chamomile blossoms
  - Combine 1 teaspoon of each in a tea. The Chen Pi relaxes the mind, and the Chamomile relaxes the body. Plus it tastes good.
- ❖ Bitters
  - Supports the liver through the digestive tract
  - David Winston's Bitter Compound contains Artichoke leaf, Dandelion root, Gentian root, Angelica root, Orange peel, Peppermint flowering tops

# DETOXIFICATION SUPPORT

## IMPORTANT

- ❖ Plan your detoxification when you can fully concentrate on it and aren't over booked
- ❖ Get plenty of rest during the first seven days of the purification. The liver requires an enormous amount of energy to do its job.
- ❖ Eat frequently.
- ❖ Refrain from microwaving foods. Microwaved foods are devitalized.

## INSIDE

- ❖ Drink the juice of ½ of a fresh squeezed lemon in a glass of warm water first thing in the morning to detoxify, strengthen the immune system and add alkalinity to the body.
- ❖ Drink plenty of filtered water. Consume water between meals rather than with meals.
- ❖ Consume organic food – preferably produced by local farmers. Be sure to include plenty of liver-supporting foods such as cruciferous vegetables.
- ❖ Take a high quality multi-vitamin 3x/day, i.e. General Health Daily Fundamentals

## OUTSIDE

- ❖ Minimize the use of plastics, especially cling wrap products.
- ❖ Leave your shoes at the door.
- ❖ Use natural cleaning products.
- ❖ Choose drycleaners that use less toxic methods of cleaning.
- ❖ Support “clean” manufacturers when purchasing furniture, clothing, flooring, etc.
- ❖ Houseplants improve the quality of indoor air.

## ON TOP

- ❖ Dry skin brushing before showering using a brush with a natural bristle. Always brush toward the heart and then immediately rinse off in the shower.
- ❖ Yoga seated twist for detoxification
- ❖ Use non-toxic skin care products or ingredients from the kitchen to clean and feed your skin.
- ❖ Lymphatic pump: before getting out of bed, place palm over navel, breathe deeply (keeping palm in same place) and then rotate your palm in a clockwise position. Repeat 12 times.

## PLUS. . .

- ❖ Exercise, massage, and acupuncture, and far-infrared saunas increase circulation to help flush out toxins trapped in the body.
- ❖ Coffee enemas, seaweed baths, and hydrotherapy are also supportive therapies

# DO-IT-YOURSELF DETOX

## FOODS TO EAT

### GRAINS

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- ❖ Brown Rice
- ❖ Basmati Rice
- ❖ Wild rice
- ❖ Rice cakes or rice crackers

### Legumes

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- ❖ Mung beans
- ❖ Bean thread noodles
- ❖ Miso
- ❖ Lentils

### Vegetables

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- ❖ Leafy green: lettuce (romaine, red, bibb), spinach, kale, chard, bok choy, arugula
- ❖ Root: carrots, beets, sweet potatoes, yams, radishes
- ❖ Cruciferous: cabbage, cauliflower, broccoli, Brussel sprouts, mustard greens
- ❖ Vine: cucumber, zucchini, squash
- ❖ Onion: garlic, onions, leeks, shallots
- ❖ Others: asparagus, celery, okra, artichoke, eggplant, beans, peppers, kelp, raw sauerkraut

### Fruit

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- ❖ All fruit except grapefruit are allowed (avoid any that bother you)

### Fats and oils

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- ❖ Extra virgin olive oil
- ❖ Unheated flax seed oil
- ❖ Unrefined coconut oil (only 2T daily)

### Beverages

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- ❖ Herbal tea
- ❖ Green tea
- ❖ Clean water
- ❖ Water with fresh-squeezed lemon
- ❖ Diluted fruit juice
- ❖ Vegetable juice

### Condiments

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- ❖ Vegetable salt
- ❖ Sea salt
- ❖ Miso
- ❖ Spices

## FOODS TO AVOID

- ❖ Meat, poultry, fish, eggs
- ❖ Dairy products
- ❖ Soy products (except miso)
- ❖ Fats and oils (other than those listed)
- ❖ Nuts
- ❖ Beans (other than those listed)
- ❖ Grains (other than those listed)
- ❖ Sugar
- ❖ Alcohol
- ❖ Coffee and black tea

## RESOURCES/REFERENCES

Living Network: <http://www.livingnetwork.co.za/chelationnetwork/food/liver-detox-pathways/> 6/25/14

Tuberose [http://tuberose.com/Liver\\_Detoxification.html](http://tuberose.com/Liver_Detoxification.html) 8/21/14

Cara Health: <http://www.carahealth.com/health-conditions-a-to-z/digestive-system/detox/365-phase-1-and-2-liver-detoxification-pathways60.html> 6/5/14

*Why Broth is Beautiful: Essential Roles for Proline, Glycine and Gelatin* by Kaayla Daniel  
<http://www.westonaprice.org/health-topics/why-broth-is-beautiful-essential-roles-for-proline-glycine-and-gelatin/> 8/21/14

*Sugar: The Bitter Truth* by Dr. Robert Lustig on YouTube (1 ½ hours long)

*Estrogen Metabolism and the Diet-Cancer Connection: Rationale for Assessing the Ratio of Urinary Hydroxylated Estrogen Metabolites* by Richard S. Lord, PhD, Bradley Bongiovanni, ND, and J. Alesander Bralley, PhD, CCN from *Alternative Medicine Review*, Volume 7, Number 2, 2002

Do-It-Yourself Detox from Paul Ratte, N.D. at Rhythms of Health, Inc. in Woodbury 651 208 1084

[DifferenceBetween.com](http://DifferenceBetween.com)

[Howjsay.com](http://Howjsay.com)

## BOOKS

*Healthy Healing* by Linda Rector Page, N.D., Ph.D. – great reference book for supportive detoxification therapies

*The Complete Guide to Cleansing and Detox – A Four Winds Holistic Cleanse* by Nicholas Schnell

*Why Do I Feel So Lousy?* By Lorrie Medford, C.N.

# CHOPPED LIVER

Serves 8

Don't make this recipe. No, I mean it. You will never look at liver the same way again; you may even consider yourself a fan. Don't say I didn't warn you.

1 pound chicken livers  
1 cup whole milk  
2 tablespoons coconut oil, divided  
½ cup minced shallots (about 3 shallots)  
1 cup brandy  
2 tablespoons butter  
¼ teaspoon sea salt  
Freshly ground black pepper

1. Rinse chicken livers and soak, refrigerated, in milk at least 8 hours or overnight.
2. Remove livers from milk and pat dry. Discard milk. Preheat a sauté pan large enough to hold livers without crowding them.
3. Heat 1 tablespoon coconut oil and cook livers until lightly caramelized, about 4 to 5 minutes per side. Remove livers from pan to cool. Finely chop reserved livers, removing and discarding any connective tissue or sinew; set aside.
4. Reheat sauté pan over medium heat; add remaining coconut oil and shallots. Sweat 3 to 4 minutes, until sexy and dark brown.
5. Remove pan from heat and add brandy; return pan to medium heat, standing clear and watching carefully to avoid igniting brandy. (if brandy ignites, don't panic it will burn off quickly.) Reduce over high heat until nearly dry, about 3 minutes.
6. Add butter to pan while stirring shallots with a spatula. Season with salt and pepper to taste. Remove from heat and allow to cool. Combine mixture with chopped liver, and refrigerate until ready to use.
7. Serve chopped liver on toasted brioche or, for you leaner friends, on thin baguette slices.\*

Source: *Shefzilla: Conquering Haute Cuisine at Home* by Stewart Woodman

\*Chopped liver was served on Le Pain de Fleur Buckwheat crackers (gluten free)