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Candidiasis Fact Sheet
(for practitioners)

Updated 1998

A) Causes

1. Overgrowth of *Candida Albicans.*

   Candida Albicans, which is best known for causing thrush in the mouth or the vagina, is a yeast which lives in all of us, usually confined to tiny colonies in the lower end of the digestive tract (especially the ascending colon), the vagina and certain skin areas. The natural tendency for this organism to colonise other areas is usually controlled by our defence (immune) systems, as well as by a host of friendly bacteria which live in large numbers in our digestive tracts (over three pounds of it).

   Candida Albicans, is dimorphic and is found in the following forms:

   - as a simple yeast
   - as a damaging fungus which puts down 'rootlets' (*rhizomes*) into the smooth inner surface of the intestinal tract, the mucous membrane.

   The transformation of a simple yeast into an aggressive fungal form occurs when there is a weakening of the natural control mechanisms exerted by

   - the friendly bacteria in the digestive tract and
   - the immune system

2. Intestinal tract parasites (flukes)

   Research results obtained by the Canadian researcher Dr Hulda Clark indicate that the presence of certain parasites in the intestinal tract can precipitate a host of ill effects including candidiasis. (*We are looking for the original research data and substantiation of these claims, which will be made available in the future. This may be a great break-through in the treatment of candidiasis and may explain why sometimes the condition returns after being treated and why some patients who have a healthy lifestyle have never inhibited the intestinal flora and suffer from candidiasis. Should you be interested in further information, please contact us at our usual number*). The parasites, which have been known since the 1920's are called flukes and are a member of the flatworm family, normally living in the intestines without causing adverse effects.

   Flukes are introduced into the system from many common sources such as undercooked meat, pets, water, general surroundings at home, etc. They and their eggs are normally passed out of the system but sometimes an adult fluke can remain and stick to the wall of the intestine. This is when problems can arise, amongst them colitis, Crohn's disease and irritable bowel syndrome (all of which are also part of the candidiasis symptomatic picture).

The parasite withstands the reintroduction of probiotics.

B) How the damaging form of the fungus affects health

- When the normal ecology of the bowel is disrupted, candida proliferates in large numbers releasing significant amounts of waste and secretory products (*candida toxins*) into the general circulation. There are over 100 recognised toxins [(1)] that can impair any organ. [(2)]

- The invasive form of candida can also penetrate the intestinal wall, enter the circulation and disseminate to other organs. When this occurs, the affected organs react to the physical presence of candida as well as presumable higher concentration of candida toxins. There may be tissue damage and inflammation. If candida invades other organs, then we are dealing with *polysystemic candidiasis* [(4)].

C) Bowel ecology

1. Bacterial sites:

   Stomach: no normally associated micro-flora due to a combination of gastric juice, rapid emptying and intense acidification;

   Small intestine: rapid flow rate. Dominated by lactic acid bacteria (*Lactobacillus Acidophilus, Lactobacillus delbruekii* and *Lactobacillus casei*);

   Large intestine: very slow flow rate. Dominated by organisms capable of growing in totally anaerobic conditions such as the *Bifidobacterium* and a benign group of bacteria called the *Bacteroides*.

2. Relevant functions of the bowel flora

   a. Manufacture of some B vitamins such as *folic acid* and especially *Biotin*;
   b. Bowel detoxification;
   c. Recycling of important substances (assimilation or binding) such as oestrogen and cholesterol;
   d. Improvement of lactose digestion;
   e. Protection against bowel colonisation by pathogens;
   f. Improvement of mineral availability;
   g. Stimulation of the immune system;
   h. (Possible) anti-tumour properties; (probable but not completely proven).
   i. Help maintain intestinal acid/alkaline balance;

Notes:

- Biotin prevents candida from turning into its aggressive form [(3)].
- Intolerance to dairy produce (especially cow-derived) is found very frequently in patients suffering from candidiasis.

D) Factors which compromise the intestinal flora and promote candida overgrowth

1. Antibiotics:

   a. Kill indigenous 'friendly' mucosal bacteria (they compete with candida for food and space as well as secreting anti-candida substances) [(5)];

   b. "In view of the explosive intensity of the [yeast] overgrowth that can follow antibiotic usage, other pro-candidal mechanisms undoubtedly exist" [(5)]. These could include:

      i. Direct immunosuppressant effect of antibiotics;

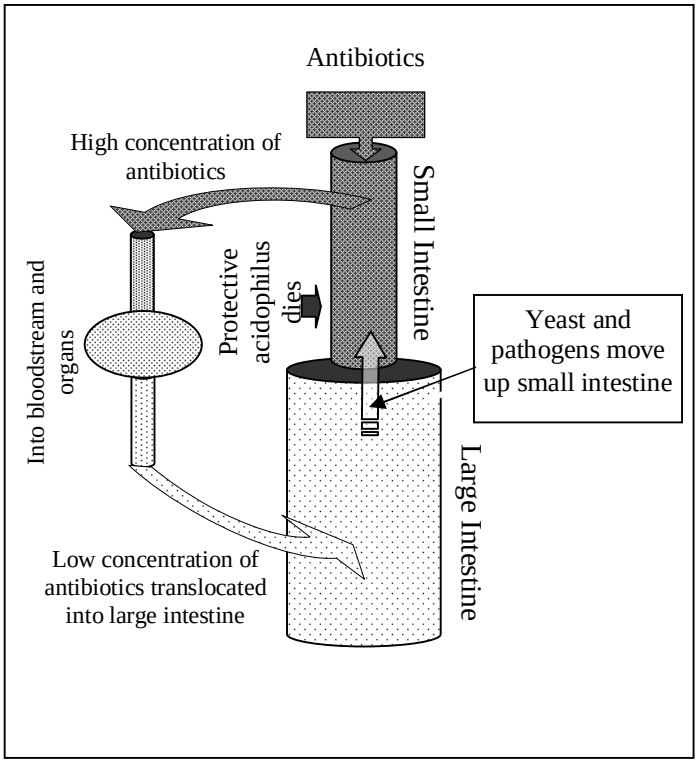
      ii. Release of immunosuppressant toxins from killed bacteria;

      iii. Direct stimulant effect on yeast growth.

   c. The concentration of oral antibiotics in the small intestine is much larger than their systemic working concentration (bloodstream concentration). That 'super-concentration of antibiotics nearly completely destroys the microorganism population of the small intestine, including acidophilus. (See diagram below)

      As the antibiotic is absorbed into the blood stream from the small intestine, it becomes diluted. Further dilution occurs as the antibiotic is distributed through the various organs and tissue types of the body. This means that the colon and its vast mass of bacteria are only

      exposed to a very dilute level of antibiotics, which have very little effect on the total number of bacteria (which include pathogens). As the yeast is not killed by the antibiotics, it moves up the small intestine.



2. Sugar: Suppresses immunity (see 3, a.iv.)

3. Poor immunity

   a. Immunosuppressants:

a.i. Nutrients deficiency (almost every nutrient known has a role to play in creating immunity [5]) (See F.16.b.);

a.ii. Heavy metal toxicity (particularly *lead* from petrol and lead plumbing [22]), *copper* [22], *aluminium* [23] and *mercury* (from amalgam fillings) [5]. *Magnesium* and *zinc* deficiencies could predispose to the heavy metal toxicity. (See also F.4. and F.16.b.)

a.iii. Stress [6, 7, 8, 9, 10, 11];

a.iv. Sugar (excessive sugar consumption depresses neutrophil and lymphocyte activity [5]);

a.v. Food and inhalant allergies [4, 12];

a.vi. Candidiasis (the sustained presence of candida burdens the immune system [13] and its toxins are immunosuppressants [1]. Food and inhalant allergies, which candida commonly causes, similarly burden the immune system [4, 12]). Notice the vicious cycle;

a.v. Steroids are immunosuppressants. [5]

b. As the protein sequence of the cell walls of candida is very similar to that of human cells. It is possible that antibodies directed at candida may cross-react with human cells. [1]).

4. Stress: Affects the immune system (see 3, a.iii.);

5. B-vitamins deficiency:

a. When *Biotin* is deficient the damage that the fungus causes to the wall of the bowel can allow toxic substances and incompletely digested food to pass through into the blood stream. This condition is often called 'leaky gut syndrome' and results in a strong possibility of allergic and toxic reactions taking place. It is via this route that yeast intolerance/sensitivity/allergy can emerge [15]. (See also H.3.) Biotin prevents candida from turning into its aggressive form [3].

b. In candidiasis, vitamin B6 (pyridoxal phosphate) deficiency is likely to occur [5] (see also F.6., F.10 and F.12.b);

6. Caffeine: Caffeine is an adrenal stressor [5] (see 'F.5.);

7. Fibre deficiency: Dietary fibre gives rise to short-chain fatty acids, which inhibit the growth of candida [5]

8. Hormones:

a. Candida is believed to possess both *oestrogen* [14] and *progesterone* [2] receptors.

b. Exogenous sex hormones [from HRT and oral contraceptives] feed the yeast desired molecules". [5]

c. Between 80 and 90% of patients treated for candida overgrowth are women.

9. Steroids:

a. Steroids such as corticosteroids seem to exert a similar influence to those of hormones. [2]

b. Steroids are also immunosuppressants. [5] (See also D.3.)

10. Specific vitamins & mineral deficiency:

a. Vitamin B6 (pyridoxal phosphate) (See F.12.b.);
b. Magnesium (See F.12.b.);
c. Zinc (See D.a.ii. and F.7.c.);
d. Fatty acid (gamma-linolenic acid)) (See F.12.b.).

(For general vitamin and mineral deficiency, see also F.16.b.)

E) Symptoms of candidiasis

Dr John Parks Trowbridge states that virtually everyone exhibits minor symptoms of candidiasis, while about one third of the population in the West is severely affected. [2] In a later publication he states that candidiasis "is a precursor for any and every degenerative disease …[since it causes] injury to every single body system". [16]

Among the many different symptoms that have been catalogued in people affected by candidiasis we find:

- allergies to breathed in substances e.g. hay fever;
- carbohydrate craving: e.g. bread, pasta, potatoes;
- cardiac arrhythmia;
- catarrh;
- chemical sensitivities;
- digestive problems: e.g. bloating (gas), irritable bowel, diarrhoea, constipation, abdominal pain, indigestion;
- discoloured nails;
- dizziness;
- earaches;
- emotional disturbances such as depression, anxiety, etc;
- fatigue;
- 'foggy' brain, impaired memory, poor concentration;
- food allergies;
- headaches;
- loss of libido;
- menstrual disturbances/irregularities;

- muscle pain;
- persistent cough;
- sinusitis;
- skin problems: e.g. acne and other skin eruptions;
- stiff and painful joints;
- urinary tract infections: e.g. vaginatis, cystitis, urethritis;

F) Effects of candida

Candida may contribute significantly to the causation of a number of medical conditions as diverse as: [5]

1. Asthma
2. Eczema
3. Epilepsy
4. Hyperactivity in children
5. Hypoadrenia (induced by candida can give rise to hypoglycaemia – see F.5.)
6. Hypoglycaemia (can contribute to development of candidiasis - see F.6.)
7. Hypothyroidism (can contribute to development of candidiasis - see F.7.)
8. Ileocaecal valve dysfunction
9. Irritable bowel syndrome
10. Liver dysfunction (induced by candida, could give rise to hypoglycaemia [5] (See F.6.) (See also F.12.d.)
11. Multiple sclerosis
12. Premenstrual tension
13. Psoriasis
14. Schizophrenia
15. Urticaria
16. Food Allergies

F.4. "We commonly note the existence of candidiasis in children with learning disability and hyperactivity" [5].

a. Mothers of hyperactive children often give a history of candidal vaginatis particularly during pregnancy [5].

b. Hyperactive children have often been exposed to antibiotics early in life [5].

c. Dyslectic tendencies appear to be related to candida-derived acetaldehyde interfering with corpus callosum function [1][27].

F.5. Healthy adrenal glands help protect from candida. [5] Conversely, candida commonly impairs adrenal functioning. [5]

a. Candida and its toxins appear to exert direct cytotoxic effect on the adrenal glands via free-radical activity. [5]

b. Experiments indicate that candida may induce autoimmune damage the adrenal glands. [5] (Candida can reduce T-cell activity [2]).

c. Candida toxins interfere with acetyl coenzyme A activity, which could inhibit the synthesis of adrenal steroids [2]. (See also D.3.b.)

d. Candida possesses receptor sites that can bind adrenal steroids thus competing with host cells, producing apparent adrenal insufficiency [2].

F.6. Candidiasis and hypoglycaemia seem to contribute to the development of each other [17][18]. [Hypoglycaemia impairs neutrophil activity and general immunity (see also D.3.)]

a. Candidiasis and hypoglycaemia share similar symptoms (fatigue, headaches, anxiety/depression, forgetfulness, poor concentration, carbohydrate craving) [19].

b. "There is no doubt that hypoglycaemia can result from food allergies, which are common in candidiasis" [5].

c. As sugar metabolism at the cellular level may be impaired by candida, this could give rise to hypoglycaemic-like symptoms. [Candida toxins interfere with acetyl coenzyme A activity reducing citric acid production] [2]. (Also see F.5.c.)

F.7. One of the first activities with which candida interferes is the functioning of the thyroid gland [16].

a. 90% of candidiasis patients have low thyroid function [14].

b. Candida receptor sites can bind thyroxine and render it physiologically unavailable[14]. (See also F.5.d.) [These may help explain the common finding of a normal blood level of thyroxine in a person who is clinically very obviously hypothyroid].

c. Since candida is commonly associated with zinc deficiency and zinc is necessary for the conversion of thyroxine to tri-iodothyronine (its active form), such deficiency could produce symptoms of hypothyroidism. [This also could occur in the presence of normal levels of thyroxine] [20].

d. Damage to the thyroid gland from candida-induced free radical activity and auto-immunity is a possibility [5]. (See also F.5.a. and b.)

F.8. When the ileocaecal valve is inappropriately open, toxic waste from the colon can regurgitate into the ileum where it can readily be absorbed. This can lead to symptoms of autointoxication such as dizziness, faintness, general aching, headache and nausea [5].

a. Candidiasis is a major cause of ileocaecal valve dysfunction [5] and vice-versa (one can exacerbate the other).

b. Other causes of ileocaecal valve dysfunction (valve not appropriately opening or closing) are: food sensitivities, intestinal acid/alkaline imbalance (See C.9. and D.1), psychological stress (See D.3.a.iii.), and adrenal gland dysfunction (See F.5.) [21].

c. When the ileocaecal valve is inappropriately open, it could exacerbate a candidal situation by allowing candida access to the ileum. [Consequently, "there may be absorption of candida toxins and possibly of candida itself"] [5].

d. Other internal parasites (nematodes, protozoa) can also disrupt the functioning of the ileocaecal valve [5]. (See also A.2.)

F.10. "The liver takes the full brunt of candida toxins emanating from the bowel" [5].

a. One of the candida toxins emanating from the bowel is acetaldehyde, a known hepatoxin. This and other toxins as well as the candida itself, which can disseminate to the liver, can put a lot of strain on that organ and disturb its function [5] [27].

b. When liver function is disturbed in candidiasis, this can lead to food allergies since the liver is responsible for removing foreign proteins from the circulation.

c. As adrenal hormones modulate allergic responses, candida-induced hypoadrenia might be part of the food allergy process [5]. (See F.5.)

d. On the other hand, predisposition to candidiasis may be induced by food allergies. [Food allergies distract the immune system [4] [12] and produce immunosuppressive chemicals such as histamine and prostaglandin E2 [13]]

F.12. Most women with premenstrual tension are suffering from systemic candidiasis [14].

a. A cause-and-effect relationship may sometimes be the case, since treatment of the candidiasis can eliminate the premenstrual symptoms [24].

b. Candida infection disrupts the metabolism of vitamin B6 and essential fatty acids and is associated with low levels of magnesium, all of which could be relevant to premenstrual tension [5].

c. Candida can apparently secrete oestrogens [1], which could contribute to the oestrogen overload that characterises most women with premenstrual tension [25].

d. It is possible that candida-induced liver dysfunction impairs the liver's ability to degrade oestrogen [5].

e. Tissue responsiveness to oestrogen is impaired in candidiasis [26] (presumably because the yeast's oestrogen receptor sites bind oestrogen of human origin, rendering it physiologically unavailable [5]). (See also F.10.)

F.16. Candida damages the gastrointestinal mucosa, increasing the permeability of the mucosa and leading to what is called the 'leaky gut' syndrome. [Caused by the candida's invading hyphae and secretory products such as acetaldehyde and phospholipase] [5] [27] (See D.5.a.)

a. When the permeability of the mucosa increases, molecules of incompletely digested food protein is allowed to enter the blood stream, provoking an immune response [4]. (See H.3.)

b. Irritation and inflammation of the intestine caused by candida may impair local immunological defence mechanisms [5] (as well as impairing the absorption of vitamins and minerals). (See A.1., C.2.a, B.5.a. and B.10.)

G) Diagnosis

There are a numbers of tests that can detect candida overgrowth in the body with different degrees of accuracy. Because yeast lives in all of us, it may be detected even when there are no actual health problems associated with its presence – therefore most tests can produce equivocal results [17][15][29]. On the other hand, even when it is widely active in areas where it is normally controlled, it is often difficult to detect candida overgrowth using standard tests [30]. A combination of two or more methods may produce a more accurate diagnosis.

The various methods of diagnosis include:

a. Taking of clinical history:

   i. The best known is Dr. William Crook's questionnaire (which is included in his book *'The Yeast Connection'* [17]). The questionnaire includes current symptoms, health history, and previous use of antibiotics and steroids on a point system which indicates the probability, possibility or slight chance of yeast being a part of the patient's health problems.

   ii. The company Biocare Ltd. also has a questionnaire, which include a self-scoring diagnostic test. (If 75% of the answers is 'yes', "yeast-connected health problems are almost certainly present").

b. Elimination and rotation:

   i. Eliminate suspected foods and substances from the diet for 5 to 7 days before reintroducing them, one by one, to see what reactions occur.

   ii. If symptoms ease or disappear during the abstinence period and re-occur when a food or substance is reintroduced, this points towards an intolerance or sensitivity to that food (this is what Leon Chaitow calls a 'masked allergy').

   iii. If there is intolerance/sensitisation, the food should be avoided for some months and, when desensitisation takes place, the food can be reintroduced in rotation once in 5 to 7 days. Eventually the patient may be able to incorporate those foods into his/her normal diet.

   iv. Another variation is 'direct challenge' whereby, after avoiding a specific food for 5 to 7 days, the patient takes a little of the food or substance to be tested. If pulse rate increases by 8 to 10 beats per minute or drops markedly, it indicates that an allergic reaction is taking place.

c. 'Sugar loading' or Gut fermentation test:

   i. Involves taking a sample of blood before and one hour after swallowing a certain amount of pure sugar on an empty stomach. The different levels of alcohol are recorded. Because yeast can rapidly turn sugar into alcohol, a rise in alcohol in the blood is used to show the

presence of yeast. This is not completely accurate because some bacteria can also turn sugar into alcohol [15].

ii. This can also be done after a 'carbohydrate load' [5].

d. Dark-field microscopy of blood [5];

e. Urine testing [5];

f. Vega testing [5];

g. Kinesiology [5];

h. Vega Biokinesiology [5].

H) How can candidiasis be controlled?

Ideally, a course of colonic irrigation should be applied to clean out the colon (colemas) – especially coffee enemas when there are associated liver problems. Other useful enemas include: flaxseedtea (to relieve inflammation), bentonite (for absorbing and mobilising toxins), acidophilus and/or bifidobacteria (can be rectally implanted overnight). This should only be done by an experienced colonic technician, who should approach pressurised colonic treatments with extreme caution in case of serious bowel problems. For practitioners in your area, phone or fax the **Colonic International Association** (16 Englands Lane, London NW3 4TG) on 0171-483 1595.

The most effective way of getting yeast under control involves a combined strategy involving changes in the diet, supplements and antifungal medication. This strategy can be briefly described as follows:

1. Purge possible intestinal parasites (See A.2.and F.8.d.);
2. Starve the yeast, depriving it of its main nutrient which is sugar (See D.2., 3.a.iv. and F.6.c.);
3. If the patient has become sensitised to yeast and its by-products, eliminate (for a while) any yeast based or containing substances and foods from your diet (See D.5.a. and F.16.a.);
4. Kill the yeast;
5. Re-introduce friendly bacteria into the intestinal tract (mainly *acidophilus* and *bifidobacteria*) (See A.1., C, D.1.);
6. Heal the possibly damaged wall of the bowels (if the inner layer of the bowel is inflamed, it makes it difficult for the friendly bacteria to stay);
7. Support the immune system by ensuring that the patient has a balanced, wholesome and nutritious diet as well as learning to deal with stress;
8. Support the liver throughout the entire process to help with the extra overload of toxins.

H.1. Since there is a strong possibility that there may be parasites (fluke) involved in candidiasis, it makes sense therefore to make sure that the patient is not carrying them before commencing the treatment proper.

The two drugs traditionally used in treatments are *bithionol* and *chloroquine* [28]. The problem with these drugs is that they are very taxing on the liver, produce very unpleasant side effects and have contra-indications [34]. The same would probably apply to any new synthetic drugs for the condition.

G & G Food Supplies Ltd [35] reports on a herbal combination researched by Dr Hulda Clark, which seems to address the problem of parasite elimination successfully (Walnut Tincture, Wormwood and Cloves).

H.2. Strictly avoid any foods containing sugar or refined carbohydrate in any form. This also includes honey, sweeteners, dairy produce and, for the first 3 to 4 weeks, all fruit (these can be gradually introduced after the abstinence period, but avoid very sweet fruit (e.g. melons) until the end of the treatment.

Pay attention to 'hidden' sugar as many foods use it in their preparation, e.g. some frozen peas, most canned foods and many packed and processed foods. Also, if eating out, the patient should ask the restaurant as sugar is used in many dishes e.g. bolognese sauce and tomato sauces in general.

Unless <u>*totally*</u> whole grain (nothing beyond the simple grinding stage), also remove refined carbohydrates from the patient's diet e.g. refined ('white') wheat flour, etc.

Apart from 'live' yoghurt (preferably organic, containing *'acidophilus'* and *'bifidobacteria'*), the patient should avoid milk and any milk products. Pasteurised milk actually encourages candida. Remember that milk contains its own form of sugar (lactose).

H.3. Avoiding foods that contain or are derived from yeast as well as foods that contain mould is only essential if the patient has become sensitised to yeast.

a. These include bread, mature cheeses (such as blue cheese), wine, beer, etc.

b. If the patient reacts to these with symptoms such as bloating, headaches, fatigue, and mood swings or increase yeast infection activity such as thrush and vaginitis, it is very likely that he/she has become sensitised to yeast.

c. The longer anyone has had a yeast overgrowth problem in the intestinal tract, the more likely it becomes that they will have become sensitised to yeast, and will react in an allergic manner to any food, drink or inhaled substances which contain yeasts or moulds [15].

H.4. The quickest and easiest way to kill *surface* yeast is a short course of Nystatin. As Nystatin only kills on contact (see IBPI) a systemic fungicide is also necessary. The use of other fungicides (such as Sporanox [37], Fungizone, etc) is not recommended because of serious reported side effects. Instead, use a gentler organic fungicide such as BioCare's [36] *Candicidin*.

H.5. *Acidophilus* and *bifidobacteria* should be reintroduced separately when used in small capsules. As there are various strains of acidophilus, the most viable one is the human strain (acid tolerant human specific lactic acid bacteria). The reintroduction of *Lactobacilus casei* is also desirable as it has the advantage of acidifying the gut producing a less favourable environment for yeast organisms. All bacteria being reintroduced will be more effective if taken at least 40 minutes before eating.

I am only aware of one product which is appropriate for short-term high intensity microflora replacement. It is called *Replete* and it is produced by Biocare [36]. This is a one-week only course, taken once daily before breakfast. After this initial high intensive replacement, high viability capsules or powder should be taken throughout treatment.

H.6. Both colonic irrigation and appropriate diet will help heal any possible inflammation in the colon. BioCare[36] has a product called *EnteroGuard* which is made specifically to maximise the healing of permeable intestinal membranes (also useful for 'leaky Gut' Syndrome). There are also natural remedies in the market, which have been shown to assist the healing of inflammation, such as *bromelain*, *garlic* capsules, *alloe vera*, etc. Garlic capsules arre also antiseptic and help to keep patogens out of the small intestine. These capsules should contain a high amount of allicin (the active ingredient) and dissolve in the small intestine rather than in the stomach.

H.7. The patient should make an effort to eat three meals a day, consisting of 50 to 60% raw food. Stress management is often necessary (including counselling, massage, relaxation, etc) to help to deal with symptoms and/or causes of candidiasis. There is also alternative support for the immune system such as *echinacea*, which has been widely researched.

H.8. A 'liver-friendly' diet is desirable for reasons already discussed. Anything that will help the liver would be appropriate (such as cod liver oil) and anything that adds to the work of the liver (such as fat, toxins, drugs, alcohol, etc) should be avoided.

Useful supplements

- If possible do hair analysis or equivalent to determine deficiency of vitamins and minerals. *[It is important that all the vitamins below (especially B) specifically say that they are yeast-free preparations] (Your healthfood shop will be able to help you with this).*

If a deficiency analysis is not possible, it is prudent to have supplementation of the vitamins and minerals below. Take them with or immediately after food. Have as much of their natural sources as possible. (All dosages are within safe limits)

Vitamin B6 (pyridoxal phosphate or pyridoxine) [*1]: 100mg twice daily for the first two weeks, then 150mg once daily for two weeks, then 100mg once daily

This is also an antidepressant vitamin. Natural sources: avocados, bran, carrots, hazelnuts, lentils, rice, salmon, shrimp, soybeans, sunflower seeds, tuna, wheat germ. Avoid cooking these foods in large amounts of water (better steamed).

Vitamin A [*2]: 2,500 IU [1 RE (retinol equivalent) = 1 mcg retinol = 6mcg beta-carotene = 5IU]

Best natural sources are halibut liver oil and liver. Also: fresh apricots (when appropriate), asparagus, broccoli, carrots, raw endive, kale, leaf lettuce, liver, mustard greens, pumpkin, spinach.

Vitamin E [*3]: (best as d-alpha tocopherol) 200 mg/IU twice daily for one month then 200mg/IU once daily

Best natural sources are: wheatgerm oil and soybean oil. Also maize/corn oil, safflower oil, sunflower oil, cod liver oil, shrimps, olive oil, greenleaf vegetables, pulses, almonds.

Magnesium [*4]: 500mg once daily (sometimes come with vitamin B6. OK in low amounts, e.g. 5mg or so)
Best natural source is soya beans. Also: nuts, whole-wheat flour, brown rice, dried peas, shrimps, rye flour, seafoods, vegetables, meats, greenleaf vegetables, almonds, carp, cod, bluefish, flounder, halibut, herring, mackerel, sunflower seeds, swordfish, wheatgerm.

Zinc [*5]: 15mg twice daily for one month, then 15 or 22 mg once daily.
Best natural source is oysters. Also: liver, shellfish, meats, canned fish, pulses, wholegrain cereals, rice, greenleaf vegetables, potatoes.

Fatty acid (gamma-linolenic acid - GLA) [*6]: 22% is better (Starflower oil capsules). Also available in oil of evening primrose, blackcurrant and gooseberry seeds.

Also supplement with

Biotin (vitamin H) [*7]: 300mg three times daily for one month, 300mg twice daily on the second month, then, 300mg once a month
Best natural sources is pig's kidney and liver (organic is best). Also: wholegrains, wheat bran, wheatgerm, corn, fish, meats, brown rice, vegetables, bulgur wheat, calf's liver, chicken, green peas, lentils, mackerel, oats, soybeans, split peas, sunflower seeds, tuna.

Vitamin B5 [*8] (Calcium Pantotenate or Pantotenic Acid) (this also known as an anti-stress vitamin): 500mg once daily
Best natural sources are pig's liver and kidney. Also: wheat bran, wheatgerm, soya flour, poultry, meats, wholegrains, pulses (beans), vegetables, corn, lentils, lamb's or calf's liver, lobster, peas, sunflower seeds.

Vitamin C [*9] (buy a good quality one, as they can be very acid in the stomach. Slow release is preferable): 1000mg twice daily for first month, then 1000mg once daily (or split dose through the day, for instance 250mg four times daily)
Best natural sources are acerola cherry juice and camu pulp. Also rose hips, blackcurrants, guavas, parsley, kale, horseradish, broccoli tops, green peppers, brussel sprouts, citrus fruits, watercress, cabbage, mustard tops, all other fruits and vegetables, collards, grapefruits, potatoes, spinach.

Selenium [*10]: 200mcg once daily
Best natural sources are organ meats (kidney, liver) and fish, shellfish/seafood. Also: muscle meats, wholegrains, cereals, fruit and vegetables, bran, broccoli, cabbage, celery, chicken, garlic, cucumbers, onions, tuna, wheatgerm, wholegrain products.

If the craving for sugar becomes too much, some chromium (from your healthfood shop) may help. Also try it in case of craving-related headaches.

[*1]: ***Practitioner supervision*** *is necessary if patient has*:
been under severe stress with illness, burns, accident, recent surgery;
intestinal problems;
liver disease;
overactive thyroid;
Parkinson's disease.

Do not take megadoses if pregnant or breast-feeding (can cause dangerous side-effects in infants)

May produce false-positive results in urobilinogen determinations using Ehrlich's reagent

Do nor crush, break or chew tablets before swallowing

Adverse reactions/side-effects:

a) Doses of 200mg/day *can* produce dependency so make sure that megadoses are discontinued gradually;
b) Very large doses (2 to 6 grams daily) taken for several months are reported to cause severe sensory neuropathy with unsteady gait, numb feet and hands, clumsiness;
c) Can cause depression when taken with oral contraceptive pill.

Back

(*2): ***Practitioner supervision*** *is necessary if patient has*:
cystic fibrosis
diabetes
intestinal diseases with diarrhoea
kidney disease
liver disease
overactive thyroid function
disease of the pancreas

Daily doses exceeding 6,000IU can produce growth retardation and urinary-tract malformations of foetus

Do not take megadoses (5,000IU is the maximum RDA for a male of 11+ years)

Lab tests affected: Poor results on dark-adaptation test
Poor results on electronystagmogram
Poor results on electroretinogram

Interactions: Vitamin A absorption is decreased by antacids, anti-coagulants, cholestyramine, colestipol, and smoking
Mineral oil, neomycin, sucralfate and isioretinoin increase possibility of vitamin A toxicity
Oral contraceptives increase vitamin A concentration

Normal amounts of vitamin E facilitate absorption, storage in the liver and utilisation of vitamin A; excessive dosage may deplete vitamin-a stores in the liver

Adverse reactions/side-effects:

Seek emergency treatment: vomiting, yellow-orange patches on soles of feet, palms of hands or skin around nose and lips
Refer to GP immediately: abdominal pain, bone/joint pain, drying or cracking of skin or lips, fever, hair loss, irritability
Consider discontinuing: appetite loss, discomfort, tiredness or weakness, headache, increased frequency of urination, , increased sensitivity of skin to sunlight

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(*3): ***Practitioner supervision*** *is necessary if patient has*:
iron-deficiency anaemia
bleeding or clotting problems
cystic fibrosis
intestinal problems
liver disease
overactive thyroid

High doses deplete vitamin A stores in the body;

Adverse reactions/side-effects:

Refer to GP immediately: abdominal pain, diarrhoea, flu-like symptoms nausea, blurred vision
Consider discontinuing: breast enlargement, dizziness, headache, tiredness or weakness

Lab tests affected: serum cholesterol and serum triglycerides may register *high* when taking large doses of vitamin E;

Interactions: antacids, cholestyramine, colestipol, mineral oil, and sucralfate decrease absorption of vitamin E;

spontaneous or hidden bleeding may be increased by anticoagulants, cumarin- or indandione-type;

vitamin E decreases effect of iron-supplement in people with iron-deficient anaemia

vitamin E facilitates absorption, storage and utilisation of vitamin A; reduces potential toxicity of vitamin A; excessive doses of vitamin E cause vitamin A depletion;

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(*4): ***Practitioner supervision*** *is necessary if patient has*:
chronic constipation, colitis, diarrhoea
symptoms of appendicitis
stomach or intestinal bleeding

Do not prescribe in cases of kidney failure (chronic kidney disease frequently body to retain excess magnesium), heart block (unless fitted with a pacemaker or ileostomy;

Don't use when pregnant;

Lab tests affected: magnesium makes test for stomach acid secretion inaccurate;
may increase or decrease serum phosphate concentrations;
may decrease serum and urine pH

Adverse reactions/side effects: abdominal pain (refer to GP immediately), appetite loss, diarrhoea (refer to GP immediately), irregular heart beat (seek emergency treatment), mood changes, nausea (refer to GP immediately), tiredness/weakness, urination discomfort, vomiting (refer to GP immediately)

Interactions: Take magnesium one or more hours apart from cellulose sodium phosphate and 2 or more hours apart from ketoconazole (c.s.p. and ketoconazole decrease magnesium effect);
Magnesium decreases absorption of mecamylamine and tetracycline (avoid combining them)
Fat soluble vitamins (A, E, K) decrease absorption of magnesium
Vitamin D may raise magnesium level too high

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(*5): ***Practitioner supervision*** *is necessary if patient has*:
to take any calcium supplement or tetracycline drugs. (Zinc may interfere with absorption of these medicines)

Lab tests affected: decreases high-density lipoprotein levels in young males
decreases copper in blood

Adverse reactions/side effects:
Seek emergency treatment: abdominal pain, abnormal bleeding
Refer to GP immediately: gastric ulceration (burning pain in upper chest relieved by food or antacid), nausea, vomiting
Consider discontinuing: mild diarrhoea

Interactions: Decreases or interferes with absorption of iron, calcium, copper and tetracycline
Diuretics and alcohol increase zinc excretion
Oral contraceptives lower zinc blood levels
Assists absorption of vitamin A
Coffee (consumed at the same time as zinc) may decrease absorption of zinc

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(*6): **Adverse reactions/side effects:** *Can* make symptoms of some problems such as asthma, migraines, arthritis worse;

(*7): **Interactions:** Antibiotics and sulphonamides lead to significant biotin deficiency as they destroy 'friendly' bacteria in the bowels
Tobacco decreases absorption
Eating large quantities of raw egg whites may cause biotin deficiency (egg whites contain *avidin* which prevents biotin from being absorbed into the body)

Back

(*8): ***Practitioner supervision*** *is necessary if patient has* haemophilia;

Do not prescribe vitamin B5 if patient is taking levodopa for Parkinson's disease;

Interactions: Small amounts of pantotenic acid nullify levodopa's effect. (Carbidopa - levodopa combination is not affected by this interaction)
Tobacco decreases absorption of vitamin B5

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(*9): ***Practitioner supervision*** *is necessary if patient has*:
Gout
Kidney stones

Sickle-cell anaemia

Lab tests affected (with megadoses i.e. above 1 gram):

Blood in stool: false negative test results
LDH and SGOT
Depending on method used, glucose in urine
Serum bilirubin: false low level
Urinary pH: false low level

Adverse reactions/side effects:

Seek emergency treatment: lower abdominal cramp, nausea, vomiting
Refer to GP immediately: anaemia
Consider discontinuing: flushed face, headache, increased urination, mild diarrhoea

Interactions: Very large doses increase chance of formation of Aminosalicylic acid (PAS for tuberculosis) crystals in urine.
Decreases effect/absorption of: anti-cholinergics, oral anti-coagulants, copper, quinidine
The following decrease vitamin C effect/absorption: aspirin, barbiturates, mineral oil, oral contraceptives, salicylates, sulpha drugs, tetracyclines, tobacco
Increases effect/absorption of: iron, calcium, barbiturates

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(*10): **Adverse reactions/side effects:**

Refer to GP immediately: dizziness and nausea without apparent cause
Consider discontinuing: fragile or black fingernails, persistent garlic odour in breath and skin, unusual hair loss or discoloration of hair

Interactions: Vitamin C may decrease absorption of *inorganic* form of selenium
Vitamin E prevents oxidasation that might cause breakdown of body chemicals

Back

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Paulo Quadros

If you are interested in finding further updates on this subject and expand this factsheet, you may also want to have a look at:

L-Glutamine
N-Acetyl L-Cysteine (NAC)
Cancer is a Fungus by Dr T Simoncini – oncologist (Edizioni Lampis, ISBN 88-87241-08-2)