Reversal of Primary and Secondary Hypertension

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Measuring & Increasing Cardiac Efficiency

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High Blood Pressure

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High blood pressure (i.e. hypertension) is abnormally high pressure in the arteries.

*Old Theory:

- Often no cause for high blood pressure can be identified, but sometimes it occurs as a result of an underlying disorder of the kidneys or a hormonal disorder.

- Obesity, a sedentary lifestyle, stress, smoking, and excessive amounts of alcohol or salt in the diet all can play a role in the development of high blood pressure in people who have an inherited tendency to develop it.

- High blood pressure with no known cause is called ***primary hypertension.*** Between 85% to 95% of people with high blood pressure have primary hypertension. Several changes in the heart and blood vessels probably combine to increase blood pressure. Primary hypertension cannot be cured, but can be controlled with prescription drugs to prevent complications.

- High blood pressure with a known cause is called ***secondary hypertension.*** Between 5% and 15% of people with high blood pressure have secondary hypertension. In many of these people, high blood pressure results from a kidney disorder. Many kidney disorders can cause high blood pressure because the kidneys are important in controlling blood pressure. For example damage to the kidneys from inflammation or other disorders may impair their ability to remove enough salt and water from the body, increasing blood volume and blood pressure. Other kidney disorders that cause high blood pressure include renal artery stenosis (narrowing of the artery supplying one of the kidneys), which may be due to artherosclerosis, injury, or other disorders. Again secondary hypertension cannot be cured, but can be controlled in the initial stages with prescription drugs. The prognosis is not good as a very large number of these patients ultimately end up with stroke and / or permanent kidney damage some time during their lifetime – it is only a matter of time.

***Adapted from: Merck Manual Professional and Merck Home Manual Edition**

New Theory:

- Often the primary cause for high blood pressure can be identified as an intracellular magnesium deficiency, but sometimes it occurs as a result of an underlying disorder of the kidneys or a hormonal disorder.
- Obesity, a sedentary lifestyle, stress, smoking, and excessive amounts of alcohol in the diet all can play a role in accelerating the development of high blood pressure. ***There is really no correlation between high blood pressure and normal salt[1] intake or hereditary factors.***
- In most people, high blood pressure does not manifest any symptoms.
- Doctors make the diagnosis after measuring blood pressure on two or more occasions.
- People are advised to lose weight, stop smoking, and decrease the amount of fat in their diets. All these factors only help to delay the onset or progression of high blood pressure.
- ***Alternative measures are usually tried before any drugs are prescribed once high blood pressure sets in.***
- Reducing one's intake of alcohol while maintaining adequate intake of magnesium and potassium makes prescription drug therapy for high blood pressure unnecessary.
- When all else fails, antihypertensive drugs are given in order to achieve immediate relief and will invariably work only in those cases of magnesium deficiency induced high blood pressure. However, these types of drugs are generally ineffective for renal induced hypertension. Long term administration of diuretics like hydrochlorothiazide (HCTZ) (in combination with antihypertensive drugs) to patients with renal induced hypertension is not advisable as these patients are already suffering kidney insufficiency and poor filtration capabilities. Adding extra burden on the kidneys with diuretic drugs such as HCTZ will only help to accelerate the degradation of kidney performance and can finally hasten it towards chronic renal failure (CRF). ***Diuretics are known to cause excessive loss of potassium and magnesium which are required to lower blood pressure.*** So the long term effect of prescription drug diuretics may actually be detrimental to the health of the patient.

To many people, the word hypertension suggests excessive tension, nervousness, or stress. In medical terms, hypertension refers to high blood pressure, regardless of the cause.

1) For importance of "Salt in Digestion" please go to: http://www.space-age.com/Salt.pdf

Because it usually does not cause symptoms for many years, until a vital organ is damaged, it has been called "the silent killer." Uncontrolled high blood pressure increases the risk of problems such as stroke, aneurysm, heart failure, heart attack, and kidney damage.

Many would like to lay blame on increasing levels of stress in the office environment and in the industrial world we live in as the cause for high blood pressure. This is generally not true.

It is not unusual to find younger people with high blood pressure / low cardiac efficiency today. This is true of approximately 25% in the age group of 25 to 35 years. This is due to the constant erosion in the nutritional value of the produce today due to over cultivation of our farmlands and rampant use of synthetic fertilizers. Stress has a minor role to play here.

High blood pressure occurs uniformly in all races and geographical locations of the world and is not exclusively related to the age of the person. However, the percentage of people affected increases with the progression of age. This is because nutrition in the body normally depletes with passing years and is more pronounced in old age. This is also further compounded by weak digestion and the inability to efficiently absorb nutrition from the food we eat as we age. Reducing salt in the diet to control blood pressure further reduces the flow of gastric juices (hydrochloric acid) essential for digestion. This can only help to enhance the severity of high blood pressure in the long run. For more info on importance of salt in digestion please go to: http://www.space-age.com/Salt.pdf

Only an estimated 70% of people with high blood pressure have been diagnosed. Of those diagnosed with high blood pressure, about 84% receive treatment, and of the people receiving treatment, only about 58% have adequately controlled blood pressure. When nutritional deficiencies become excessive, most antihypertensive drugs fail to achieve the desired results and seem ineffective.

The prognosis for such patients can be a stroke and/or failed kidneys. It is only a matter of time.

High blood pressure is not age related. Blood pressure found in excess of 120/80 sould call for exploratory methods of its correction as a good preventive medicine practice.

It is important to assess the “cardiac efficiency” of the patient and immediately correct it, rather than wait for blood pressure, tachycardia or bradycardia to manifest itself.

In case of exceedingly low heart rate, below 60 bpm, please check for missed heart beats. This is a serious cardiac problem which requires immediate attention and correction.

Before proceeding with the rest of this paper, readers are requested to proceed to Appendix I where they will be taken through a short refresher course in undergraduate nutrition with special emphasis on magnesium and its effect on blood pressure. Thereafter, readers are recommended to proceed to Appendix II for pathology of serum magnesium. Then Appendix III for a refresher course in Orthomolecular / Intracellular Magnesium. Then Appendix IV for a refresher course in salt and its effect on blood pressure and a discussion on the Importance of Salt in Diet. Thereafter to Appendix V for a short refresher course in vitamin D and its importance in cardiology.

Reference is taken of standard undergraduate textbooks of nutrition in order to create a sound foundation. My commentary in italics and parenthesis is added where the need was found to amplify and clarify with respect to treatment and reversal of high blood pressure and improving cardiac health.

These refresher courses are highly recommended for MDs, Cardiologists, family physicians and health care practitioners in all faculties of medicine.

Once the ground work is established to understand the intricacies of nutrition and its effect on high blood pressure, and its importance in preventive cardiac health, the study of the rest of this paper and the numerous case studies will be easy to follow.

Please proceed to page 30 for Appendix I - Part A and then to Page 35 for Appendix I - Part B for more information on magnesium and then to Appendix II / Page 42 for pathology of serum magnesium. Then Appendix III / Page 44 for a refresher course in Orthomolecular / Intracellular Magnesium. Then Appendix IV / Page 49 for a refresher course in salt and its effect on blood pressure and a discussion on the Importance of Salt in Diet. Thereafter to Appendix V / Page 58 for a short refresher course in vitamin D and its importance in cardiology.

Later on please come back to page 4 to continue where you left of.

Note:

BP = Blood Pressure / P = Heart Rate (Pulse) - after 10 minutes of rest.
BPs = Blood Pressure / Ps = Heart Rate (Pulse) – immediately after standing up.

Normal Blood Pressure & Heart Rate

BP for Vegetarians and Asians With Predominantly Vegetarian Diet

- BP = 110 / 70 mm Hg
- Heart Rate / Pulse P = 70 beats per minute
- BP and Heart Rate on Exercising must increase ⇑ to reflect **Good Cardiac Efficiency.**
- If instead it goes down ⇓ then it means or is a foreboding of a **Serious Heart Disease.**
- BPs = 120 / 80 to 125 / 85 mm Hg
- Heart Rate / Pulse Ps = 85 beats per minute

BP for Caucasians (Predominantly Meat Eaters)

- BP = 120 / 80 mm Hg
- Heart Rate / Pulse P = 70 beats per minute
- BP and Heart Rate on Exercising must increase ⇑ to reflect **Good Cardiac Efficiency.**
- If instead it goes down ⇓ then it means or is a foreboding of a **Serious Heart Disease.**
- BPs = 130 / 90 to 135 / 90 mm Hg
- Heart Rate / Pulse Ps = 85 beats per minute

The Art of Measuring Blood Pressure

- The patient is seated in a chair and made to relax for **10 whole minutes**, before the cuff of a manually pumping digital blood pressure measuring machine is placed on the upper left arm. After manually pumping, the Blood Pressure (**BP**) is measured along with the Heart Rate (**P**).
- Thereafter, the patient is asked to stand up and this measurement is once again immediately repeated. The standing Blood Pressure (**BPs**) and the Heart Rate (**Ps**) is also noted.

The Interpretation of These Numbers

- The interpretation of these numbers (pertaining to **Cardiac Efficiency**) is as follows:
- In a normally health young person, with good cardiac efficiency, the systolic, diastolic and heart rate should **increase by 10 to 15 points** upon standing up.
- Poor or small increase in any or all of these numbers is indicative of poor cardiac efficiency.
- A fall in any of these numbers is indicative of a serious cardiac inefficiency and is foreboding of an eminent cardiac event.
- Tachycardia or Bradycardia is indicative of a serious overall nutritional deficiency pointing principally to an intracellular magnesium deficiency.

"Cardiac Efficiency"

- BP = 110 / 70 mm Hg (Systolic / Diastolic)
- P = 70 beats per minute (after 10 mins. rest)
- BP_S = 120 to 125 / 80 to 85 mm Hg (after immediately standing up)
- P_S = Standing Heart Rate = 80 to 85 beats per minute (must increase ⇑ on exercise)
- No increase in BP or Heart Rate indicates **Poor Cardiac Efficiency**
- Falling ⇓ BP or Pulse is indicative of an **Serious Cardiac Inefficiency** and is a foreboding of an ***Eminent Cardiac Event***.

From a prevention point of view, It is more important to routinely check for "cardiac efficiency" and correct it in the initial stage, rather than wait for the next stage when blood pressure rises and/or tachycardia / bradycardia manifests itself.

In case of exceedingly low heart rate, below 60 bpm, please check for missed heart beats. This is a serious cardiac problem which requires immediate attention and correction.

Treatment for High Blood Pressure

Serum Magnesium

- The international standard is:

Standard Reference Range

1.8 mg/dL to 3.0 mg/dL

(0.7 mmol/L to 1.2 mmol/L)

Optimum Value

2.4 mg/dL to 2.8 mg/dL

(1.0 mmol/L to 1.2 mmol/L)

- Serum magnesium is not a very accurate assessment.
- Intracellular measurement is a more sensitive test.

RBC Magnesium

- Measurement at Intracellular Level.
- Also known as Erythrocyte Magnesium

Standard Reference Range

4.2 mg/dL to 6.8 mg/dL
(1.75 mmol/L to 2.8 mmol/L)

Optimum Value

5.5 mg/dL to 6.0 mg/dL
(2.3 mmol/L to 2.5 mmol/L)

Low Serum Magnesium - Symptoms

Values below 2.4 mg/dL (1.0 mmol/L) are encountered in patients suffering from:

1) High Blood Pressure
2) Type 2 Diabetes
3) Tachycardia
4) Bradycardia
5) Low or falling LVEF
6) Other Cardiac Diseases

or a combination of these depending on how serious the magnesium deficiency really is.

Correcting Magnesium Deficiency - I

- Recommended Daily Allowance
  RDA = 350 mg
- Optimum Daily Allowance
  ODA = 600 mg
- **Therapeutic Dose** =
  Elemental Organic Magnesium 1000 - 1440 mg / day in 4 equal divided doses for few months.
- **Organic Magnesium (Forte)**
  Elemental 360 mg q4h for 3 to 6 months.

Correcting Magnesium Deficiency - II

- Calcium is an antagonist to magnesium and will block its absorption.
- Stop calcium supplements.
- Stop dairy products like milk, cheese, butter milk, etc.
- Not easy to correct magnesium deficiency.
- Will normally take six months to one year to correct the deficiency.

Around this time please do a serum magnesium test after discontinuing all magnesium supplementation for a **minimum period of 7 days.**

Continue intracellular magnesium supplements with other supporting nutrients until serum magnesium reaches optimum serum level of 2.4 mg/dL (1.0 mmol/L) indicated above.

If serum uric acid or creatinine levels are above optimum and closer to the upper end of the Standard Reference Range, please **discount** all serum mineral levels including magnesium by 10% to 20% to arrive at the **true (retained)** serum levels.

Renal Profile	Optimum Level	Std. Reference Range
Blood Urea Nitrogen	**12.0 mg/dL**	**7.0 to 18.0 mg/dL**
Serum Creatinine	**0.8 mg/dL**	**0.5 to 1.5 mg/dL**
Serum Uric Acid	**4.0 mg/dL**	**3.6 to 7.8 mg/dL**

If Blood Urea Nitrogen (BUN) is at the lower end of the Standard Reference Range or below normal, it means that there is a serious **"Nitrogen Imbalance"** in the body caused by very low dietary protein intake. In that case, readings in the Renal Profile will be inconclusive and should not be relied upon.

If there is no protein / nitrogen deficiency in the body, and serum creatinine and serum uric acid are much higher than the **Optimum Levels**, it would be advisable to first detoxify the kidneys to lower these numbers and bring the kidneys to a more optimal functional state. For more information on detoxification of kidneys please go to: http://www.space-age.com/Detox.pdf

For case studies on lowering creatinine and serum uric acid as well as how to improve kidney efficiency please read the following papers published by A4M – The American Academy of Anti-Aging Medicine, Textbook Series - Volume 12 and 13:

http://www.space-age.com/AntiagingOrland.pdf
and
http://www.space-age.com/AntiagingSanJose.pdf

If in doubt about a possible kidney malfunction (renal insufficiency), please do the serum Cystatin - C Test.

The Cystatin - C test helps identify kidney dysfunction at earlier stages, before symptoms appear and creatinine levels rise. Again, this is a serum protein test and will be inconclusive in case of a serious protein / nitrogen deficiency in the body.

A kidney malfunction (renal insufficiency) invariably causes “Renal Induced Hypertension” also known as “secondary hypertension”. This high blood pressure does not respond to hypertension lowering drugs like amlodipine or atenolol. The solution to lowering such Renal Induced Hypertension is to first detoxify and repair the kidneys and bring the Renal Profile to optimum levels as previously referenced.

Cystatin - C

Cystatin C (cysteine protease inhibitor) is a serum protein that is filtered out of the blood by the kidneys and that serves as a measure of kidney function. An increased serum Cystatin C corresponds to a decreased GFR (glomerular filtration rate) and hence to kidney dysfunction.

The Cystatin C test helps identify kidney dysfunction at earlier stages, before symptoms appear and Creatinine levels rise.

It also helps predict impending cardiovascular problems such as heart attack, stroke etc, in the elderly.

Reference Range: (Random Blood Sample)
Male & Female: 0.53 to 0.95 mg/L

Optimum Value:
Male & Female: ≤ 0.7 mg/L

Notes:

If high blood pressure is primarily due to magnesium deficiency, continue taking therapeutic doses of organic magnesium supplements, along with other supporting nutrients, designed to alter intracellular magnesium levels until optimal Cardiac Efficiency is achieved. About 70% of all cases of high blood pressure are due to primary hypertension due to a serious and prolonged magnesium deficiency. Hence there is no correlation between high blood pressure and normal salt intake. Chronic hypertension is a fully reversible “symptom” due to chronic nutritional deficiencies and is therefore neither “hereditary” nor a “disease.”

If high blood pressure is due to a secondary cause like renal insufficiency, it is best to undergo an elaborate kidney detoxification to bring serum creatinine and serum uric acids down to optimum levels, as referenced above. About 10% of all cases of high blood pressure are due to secondary hypertension. Again, hereditary has no role to play here. This is also reversible in a majority of cases. The prognosis for uncorrected renal induced hypertension is not good, as a very large number of these patients ultimately end up with stroke and / or permanent kidney damage – it is only a question of time.

For more information on enhancing kidney efficiency, please refer to the case studies on lowering creatinine, serum uric acid published in following papers by A4M – The American Academy of Anti-Aging Medicine, Textbook Series - Volume 12 and 13:

http://www.space-age.com/AntiagingOrland.pdf
and
http://www.space-age.com/AntiagingSanJose.pdf

For more information on the detoxification of kidneys, please go to:
http://www.space-age.com/Detox.pdf

Many times you will find primary and secondary hypertension coexisting together. This happens in about 20% of all high blood pressure cases. In such cases, if the kidneys are well above the standard reference range, it is important to first start with kidney detoxification (i.e. servicing and repair of organs) before attempting intracellular magnesium therapy. Basic kidney repair may take 3 to 6 months of treatment before magnesium therapy can be commenced.

In each of these cases it is best to monitor the progress of the treatment by use of a simple digital blood pressure monitoring machine. Manual pumping, upper arm machines are preferable as they are fairly accurate and easy to use while measuring one's own blood pressure. With this machine, you can also indirectly monitor the monthly improvements in nutritional levels and / or kidney function on a daily, weekly and monthly basis by maintaining a daily log of the readings.

It normally requires 6 to 9 months to reverse primary and secondary hypertension in a majority of cases. One should look for a possibility of gradually titrating downward the antihypertensive prescription drugs around the third month of beginning the treatment as mentioned above. Dependence on diuretic drugs should be preferentially and gradually titrated downwards as it results in excretion of potassium and magnesium from the body, which are essential nutrients for lowering high blood pressure.

Here are some interesting case studies in kidney detoxification which is fundamental to the treatment of secondary hypertension:

A good detoxification process of the kidneys should help a fairly healthy person, to change his or her kidney profile, irrespective of their physical age, to closely match the optimum values of Renal Profile given earlier.

Patient: Female, Age: 39, Height: 5ft 3 in., Weight: 163.6 lb (74.36 Kg.), Fat = 42.5% (++), BP = 107 / 71, Pulse = 67 bpm, Diet: Meat Eater (Ref: BD)			
Renal Profile	**# Std. Ref. Range**	*** 10/12/2007**	**** 12/03/2007**
Blood Urea Nitrogen (BUN)	4.5 to 21.0 mg/dL	17.0 mg/dL	11.0 mg/dL
Serum Uric Acid	3.6 to 8.2 mg/dL	4.3 mg/dL	4.0 mg/dL
Creatinine	0.5 to 1.5 mg/dL	1.0 mg/dL	0.6 mg/dL
Serum Total Proteins	6.4 to 8.3 g/dL	8.70 g/dL	7.6 g/dL
Serum Albumin	3.4 to 4.8 g/dL	5.4 g/dL	4.9 g/dL
# Correlate with clinical symptoms			
Note: 8 week detoxification program was started on October 15, 2007			
* Prior to starting detoxification.			
** After 7 weeks of complete body detoxification			

Table 1 - Case Study No. 1(A)
Diagnosing and Preventing Kidney Failure Through Kidney Detoxification

The patient in case study 1(A) originally came to us for a treatment of "mainstream medicine induced hypothyroidism" resulting from a radioactive iodine treatment for hyperthyroidism done many years earlier and the ensuing obesity. In the course of routine investigation, numerous blood tests were carried out as per the requirements of preventive health care and anti-aging medicine.

When we looked at the Renal Profile of the patient, everything looked "normal" except for the slight increase in the serum proteins and albumin levels. However, the serum magnesium and zinc levels were higher than values normally encountered in a patient with this medical history. This gave us an indication of an underlying kidney malfunction. Based on this data, an initial diagnosis of kidney insufficiency (malfunction) was arrived at and the patient was put through a standard detoxification program with special emphasis on an extended kidney detoxification. Later on in this paper we will restudy this case in a more detailed manner to see how we immediately verified this initial diagnosis to illustrate that a proper kidney detoxification would prevent a chronic renal failure (CRF) in the future. The progress of this case during the first seven weeks (Table 1) shows a marked improvement in the kidney function and paved the way for returning the kidneys to youthful healthy levels and maintaining them at optimum levels, in the future, as per the goals of anti-aging medicine and preventive health care.

Patient: Male, Age: 40, Height: 5ft 6 in., Weight: 170.0 lbs. (77.272 Kg.), Fat = 26.7% (++), BP = 153 / 97, Pulse = 98, BPs = 174 / 99 Pulse = 87 Diet: Vegetarian (Low Protein) (Ref: DP)				
Renal Profile (Std. Reference Range)	*** 03/24/2009**	**** 04/22/2009**	***** 06/24/2009**	****** 09/01/2009**
Serum Uric Acid (2.1 to 7.8 mg/dL)	7.2 mg/dL	6.5 mg/dL	4.8 mg/dL ⇓	# 6.8 mg/dL ⇓
Creatinine (0.5 to 1.5 mg/dL)	1.2 mg/dL	1.2 mg/dL	1.2 mg/dL	1.0 mg/dL ⇓
Allopurinol	100 mg qd	100 mg qd	100 mg qd	100 mg qd
Acetaminophen 500 mg (Paracetamol)	bid	bid	bid, on and off	Nil for last 8 weeks
Standard 8 Weeks Detoxification & Rejuvenation Program		Began on 04/04/2009	Special Kidney Detoxification	Special Kidney Detoxification
Herbal Teas for Kidney Detoxification (2 Types)		2 cups per day	4 cups per day	3 cups per day
Special Vitamin C (With Neutral pH)	Nil	Nil	500 mg bid from 07/10/2009	500 mg bid
Serum Uric Acid = 10.4 mg/dL on 07/29/2005 when Allopurinol 100 mg qd and Acetaminophen (Paracetamol) 500 mg bid was started. Left kidney is seen in ectopic location in left illiac fossa and is malrotated. Normal high velocity low impedance flow in main renal artery. Patient only on carbohydrate diet.				
Note: 8 week detoxification program was started on April 04, 2009.				
* Prior to starting detoxification. Condition is pre-gout stage with serious walking difficulty.				
*** After 11 weeks of whole body detoxification with extended kidney detoxification using herbal supplements + herbal teas. Patient on carbohydrate diet.				
**** After 21 weeks of kidney detoxification. # Patient on a restricted diet with 0.3 oz. (10 g) max. veg. proteins / day. Weight reduced to 157.6 lbs. (71.636 Kg) and body fat reduced to 22.4 % (+). A body fat drop of 4.3%.				

Table 2 - Case Study No. 2(A)
Kidney Detoxification for Lowering Serum Uric Acid & Creatinine (Chronic Case)

The patient in case study 2(A) began suffering frequent bouts of joint pains about 10 years back. These were treated with acetaminophen (paracetamol) 500 mg bid. No inference was reached as to what triggered these episodes. If inflammation ensued, it was treated with the addition of diclofenac 50mg. This continued until 2005, with the frequency of these episodes increasing steadily, when it was finally detected that serum uric acid had reached 10.4 mg/dL. At this stage, allopurinol 100 mg qd was prescribed to maintain serum uric acid at slightly lower levels. The patient, an Endocrinologist, came to us in March of 2009 seeking treatment to lower serum uric acid levels through the detoxification of kidneys. At that stage, joint pain was a regular feature, with serious walking difficulty and the case appeared to be a pre-gout condition solely controlled with allopurinol 100 mg qd, which helped to maintain serum uric acid at 7.2 mg/dL. During a routine check up, the patient was also detected with high blood pressure which had gone undiagnosed for many years.

An elaborate kidney detoxification program was started to lower the serum uric acid and the creatinine levels and to prevent a future occurrence of CRF and / or stroke. This would have been the prognosis of this case under mainstream medicine today. The progress of the patient over a 5 month period is shown in Table 2.

Here is a more advanced analysis of the kidney detoxification case shown above with more detailed and in depth study:

Patient: Female, Age: 39, Height: 5ft 3 in., Weight: 163.6 lbs. (74.36 Kg.), Fat = 42.5% (++), BP = 107 / 71, Pulse = 67, Diet: Meat Eater (Ref: BD)				
Renal Profile	*** 10/12/2007**	**# Std. Ref. Range**	**** 12/03/2007**	****** 04/18/2008**
Blood Urea Nitrogen (BUN)	17.0 mg/dL	7 to 18.7 mg/dL	11.0 mg/dL	12 mg/dL
Serum Uric Acid	4.3 mg/dL	2.6 to 6.0 mg/dL	4.0 mg/dL	3.5 mg/dL
Serum Creatinine	1.0 mg/dL	0.6 to 1.1 mg/dL	0.6 mg/dL	0.75 mg/dL
Serum Total Proteins	8.70 g/dL	6.4 to 8.3 g/dL	7.6 g/dL	7.75 g/dL
Serum Albumin	5.4 g/dL	3.4 to 4.8 g/dL	4.9 g/dL	5.07 g/dL
Serum Globulin	3.3 g/dL	1.8 to 3.6 gm%	2.7 g/dL	2.68 g/dL
A/G Ratio	1.64	1.1 to 2.2	1.81	1.89
Cystatin C	**1.02 mg/L ⇑**	0.53 to 0.95 mg/L	**0.77 mg/L ⇓**	**0.71 mg/L ⇓**
C Reactive Protein	2.71 mg/L	Upto 3.0 mg/L	1.95 mg/L	0.93 mg/L
Daily Protein Intake RDA = 1 g/Kg Body Weight	Unrestricted	Approximately 2.0 oz. (60 g)	Vegetarian 0.3 oz. (10 g)	Unrestricted (Avg. 1.0 oz. (35 g)
# Correlate with clinical symptoms				
Note: 8 week detoxification program was started on October 15, 2007				
* Prior to starting detoxification. At the start of the program she was put on restricted protein (only vegetarian) diet of only 0.3 oz. (10 g) per day				
**After 7 weeks of whole body detoxification. Her protein (mixed) intake was increased to 25 g /day after noting the improvement in renal function				
**** After 24 weeks when there were no restrictions imposed on her protein intake for the last 16 weeks.				

Table 3 - Case Study No. 1(B)
Preventing Kidney Failure - Advanced Analysis

Cystatin C (cysteine protease inhibitor) is a serum protein that is filtered out of the blood by the kidneys and that serves as a measure of kidney function. An increased serum Cystatin C corresponds to a decreased GFR (glomerular filtration rate) and hence to a kidney dysfunction.

The Cystatin C test helps identify kidney dysfunction at earlier stages, before symptoms appear and creatinine levels rise.

Standard Reference Range: (Random Blood Sample)
Male & Female: 0.53 to 0.95 mg/L

Optimum Value:
Male & Female: ≤ 0.7 mg/L

The initial diagnosis of a serious kidney malfunction, case study 1(A) given above in Table 1, was immediately verified on the same blood sample by conducting the Cystatin C test prior to confirming the need for an elaborate and extended kidney detoxification program.

The above is a case study on kidney servicing, detoxification and rejuvenation. The patient is taken from the precipice of chronic renal failure (CRF) to good health. Here the kidney function has been returned back to fairly

youthful levels in a matter of a short period of 7 weeks. Further improvements are noted at the end of 24 weeks when Cystatin C has been brought down to an optimum value of 0.7 mg/L.

The next in-depth study we are going to do pertains to a treatment of secondary hypertension and improvement in **Cardiac Efficiency.** This case shows how high blood pressure, induced by renal insufficiency and nonresponsive to prescription drugs, can be lowered solely through detoxification of kidneys.

Patient: Male, Age: 40, Height: 5ft 6 in., Weight: 170.0 lbs. (77.272 Kg.), Fat = 26.7% (++), BP = 153 / 97, Pulse = 98, BPs = 174 / 99 Pulse = 87 Diet: Vegetarian (Low Protein) (Ref: DP)				
Renal Profile (Std. Ref. Range)	*** 03/24/2009**	**** 04/22/2009**	***** 06/24/2009**	****** 09/01/2009**
Serum Uric Acid (2.1 to 7.8 mg/dL)	7.2 mg/dL	6.5 mg/dL	4.8 mg/dL	6.8 mg/dL
Allopurinol	100 mg	100 mg	100 mg	100 mg
Acetaminophen 500 mg (Paracetamol)	X 2	X 2	X 2 on and off	Nil for 8 weeks
Amlodipine	5.0 mg		5.0 mg	Nil for 4 weeks
Blood Pressure (BP) & Heart Rate (P)	**BP = 153/97 P = 98 ⇑**	**BP = 160/100 P = 96 ⇑**	BP = 130/94 P = 80	BP = 130/79 P = 78
Standing Blood Pressure (BPs) + Standing Pulse (Ps)	**BPs = 174/99 Ps = 87**			BPs = 143/95 Ps = 89
Heart Rate (Standing) Ps	**# Ps = 87 ⇓**			Ps = 89 ⇑
Std. 8 Weeks Detoxification & Rejuvenation Program		Began on 04/04/09	Sp. Kidney Detox.	Sp. Kidney Detox.
2 Herbal Teas for Kidney Detox.		2 cups per day	4 cups per day	3 cups per day
Special Vitamin C (With Neutral pH)	Nil	Nil	500 mg X 2 from 07/10/2009	500 mg X 2
# Falling Heart Rate ⇓ on exercising indicates poor cardiac efficiency and a serious intracellular magnesium deficiency. High BP ⇑ not responding to amlodipine indicates malfunctioning of kidneys is also a prime cause of hypertension.				
* Prior to starting detoxification. Condition is pre-gout stage with serious walking difficulty.				
*** After 11 weeks of whole body detoxification with extended kidney detoxification using herbal supplements + herbal teas				
**** After 21 weeks of kidney detoxification. Weight = 157.6 lbs. (71.636 Kg), Weight reduced by 12.4 lbs. (5.636 Kg). Fat reduced to 22.4% (+). Body fat reduced by 4.3%.				

Table 4 - Case Study No. 2(B)
Kidney Detoxification for Lowering Secondary Hypertension – Advanced Analysis

The above is an in-depth view of case study 2(A) given above in Table 2, where an elaborate kidney detoxification was done over a 5 months period. Kidney detoxification has also been shown to help reduce “renal malfunction induced hypertension” and reduce heart rate which normally does not respond to hypertension prescription drugs like amlodipine.

The Art of Measuring Blood Pressure and Meaning Behind These Numbers.

The patient is seated in a chair and made to relax for 10 whole minutes, before the cuff of a manually pumping digital blood pressure measuring machine is placed on the upper left arm. After manually pumping, the blood pressure (BP) is measured along with the heart rate (P).

Thereafter, the patient is asked to stand up and this measurement is once again immediately repeated. The standing blood pressure (BPs) and the heart rate (Ps) is also noted.

The interpretation of these numbers (pertaining to **Cardiac Efficiency**) is as follows:

1. In a normally healthy young person, with good cardiac efficiency, the systolic, diastolic and heart rate should increase by 10 to 15 points upon standing up.
2. Poor or small increase in any or all of these numbers is indicative of poor cardiac efficiency.
3. A fall in any of these numbers is indicative of a serious cardiac inefficiency and a foreboding of an eminent cardiac event.
4. Tachycardia or bradycardia is indicative of a serious overall nutritional deficiency pointing principally to an intracellular magnesium deficiency.

Some of the indicators which should signal the need of immediate kidney detoxification are:

1. Values in the renal profile of the patient are on the higher end of the standard reference range;
2. Values in the renal profile are not conclusive and do not correlate with the clinical symptoms, then Cystatin C and / or the GFR values should be checked and brought down to the optimum value;
3. Higher than normal levels of minerals like magnesium, zinc, calcium, etc. which appear to be falsely elevated due to improper filtration in the kidneys and its inability to maintain the body's electrolyte (mineral) balance;
4. Uncontrolled hypertension not responding to standard prescription drugs; and
5. To look for some other markers which may be inadvertently overlooked like:
   a) Calcium oxalate crystal in the urine
   b) Calcification of the kidney
   c) Formation of kidney stones

While detoxification of the kidneys will help to remove calcium deposits in the kidneys, including small stones (normally less than 4 mm in diameter), it will in no way prevent their reformation. For this, one must address the underlying cause of their formation in the first place. This means, we have to go to the root cause of

their formation. Here the cause normally encountered is excess calcium in the body coupled with magnesium deficiency. The only way to resolve these problems on a permanent basis after a proper and thorough kidney detoxification is to administer therapeutic doses of organic magnesium at intracellular levels and to remove calcium toxicity by correcting the ratio of magnesium to calcium in the body. This can also help to remove the presence of calcium oxalate crystals in the urine which is also an indication of a serious magnesium deficiency.

The presence of osteoarthritis, osetophytes, and bone / heel spurs is also an indication of magnesium deficiency and calcium “toxicity” in the body. This is invariably caused by the intake of calcium supplements (taken in isolation without other supporting and essential nutrients for bone formation) for prolonged periods in the belief that calcium is “good” for the prevention of osteoporosis.

Additional Notes on Cardiac Efficiency & the Art of Measuring Blood Pressure

Using a digital blood pressure machine, the procedure outlined above helps to detect the following:

High Blood Pressure
Low Blood Pressure
Tachycardia
Bradycardia
Left Ventricle Hypertrophy
Systolic Dysfunction
Diastolic Dysfunction
Left Ventricular Ejection Fraction (LVEF)
Cardiac Efficiency

As a matter of fact, this procedure is a low cost approach for a family physician to quickly monitor the weekly progress of the patient once the Cardiologist who uses 2 D Echo Color Doppler Studies has identified these problems. All this can be done with a low cost manual pumping digital blood pressure machine. The skill is how accurately the measurements are carried out in your clinic. More importantly it allows the physician (or the patient) to monitor on a weekly basis the progress of the patient to the intracellular nutritional treatment given. 2 D Echo Color Doppler Studies can be repeated at the end of 3 and / or 6 months based on the progress achieved during these weekly measurements.

Most importantly, it allows the computation of Cardiac Efficiency which is very important in preventive medicine, as it shows up years before high blood pressure, tachycardia or bradycardia problems surface and hypertensive drugs are required.

Invariably, all the above problems do point primarily to a serious intracellular

magnesium deficiency, which can be corrected with special synergistically formulated magnesium designed to easily penetrate intracellular spaces. To achieve this one must have at ones' command the technique to alter cell membrane permeability and a carrier mechanism to carry nutrition to the center of the cell where it is really required. With this technology, a lot of cardiac diseases listed above can be reversed with a very high rate of success. This subject is called Orthomolecular Medicine (word coined by Nobel Laureate Linus Pauling in 1968) or Intracellular Medicine. More details along with case studies are available for those interested in doing detailed studies.

On the other hand, the orthostatic hypotension test is only targeted at patients with below normal blood pressure which could perhaps be indicative of adrenal fatigue. Many times, such low blood pressure is also because the heart muscles are weak and do not contract and relax properly. Calcium causes muscles to contract and magnesium causes muscles to relax. Improper ratio of calcium to magnesium in the body is the primary cause that needs to be first corrected before arriving at an adrenal fatigue diagnosis. Again, in males weak heart muscles can also be due to low testosterone levels. I would explore all these avenues before arriving at an adrenal fatigue diagnosis.

Again, if your patients complain of low energy levels throughout the day and/or especially on waking up, I would first check the possibility of acute anemia at intracellular levels. For this the regular CBC should not be your guide. You must study Ferritin levels even if hemoglobin appears to be normal. Otherwise, you will miss the diagnosis of acute anemia.

If the cortisol levels appear low at 8:00 am in the morning and / or at 4:00 pm in the afternoon, then it could be that the patient is also suffering hormonal imbalance symptoms and suffers insomnia (loss of sleep at night) due to possible night sweats. In that case, it is important to correct the hormonal imbalance symptoms first. A power nap for 30 minutes in the afternoon (between 2:00 pm to 4:00 pm) is recommended for executives who work under high stress and tire out by afternoon. This way the cortisol levels will change for the better and the low energy levels in the later part of the day will improve.

Calcification of arteries, heart valves, mitral valve prolapse, etc. all point principally to an intracellular magnesium deficiency. For correction of magnesium levels at intracellular levels it is important to use only organically formulated magnesium in synergy with other supporting nutrients. It is also important to alter cell membrane permeability and have a proper carrier mechanism to carry nutrition to the center of the cell to carry out proper repairs to the heart, improve Left Ventricular Ejection Fraction (LVEF) and Cardiac Efficiency.

Here are some more case studied done in reversal of primary hypertension and reversal of a combination of primary and secondary hypertension:

Patient: Female, Age: 24, Height: 5ft 7 in., Weight: 131.2 lbs. (59.636 Kg.), Fat = 24.56% (0), BP = 162 / 105, Pulse = 69, BPs = 149 / 103 Pulse = 78 bpm Diet: Vegetarian (Low Protein) (Ref: DK) without Rx = without Antihypertensive Prescription drugs				
Cardiac Profile (Standard Reference Range)	* 05/18/2010	** 06/26/2010	07/07/2010	*** 08/31/2010
Blood Pressure (BP) (110/70) & Heart Rate (P) (70)	BP = 162/105 P = 69	BP = 143/92 P = 72	BP = 128/91 P = 74	BP = 114/83 P = 73
Standing Blood Pressure (BPs) Standing Pulse (Ps)	# BPs = 149/103 ⇓ Ps = 78	BPs = 141/98 Ps = 76	BPs = 136/91 Ps = 66 ⇓	BPs = 117/86 Ps = 82 ⇑
Heart Rate (Standing) Ps bpm	Ps = 78	# Ps = 76	# Ps = 66 ⇓	Ps = 82 ⇑
Risk Profile	High as w/o Rx	High as w/o Rx	Moderate as w/o Rx	Low no Rx required
Cardiac Efficiency	Poor. Blood Pressure falls on exertion	Poor. Blood Pressure falls on exertion	Poor. Heart Rate falls on exertion	Fair. Blood Pressure rises on exertion
Renal Profile (Standard Reference Range)	* 05/21/2010			
Serum Creatinine (0.6 to 1.4 mg/dL)	0.85 mg/dL			
Serum Uric Acid (2.6 to 6.0 mg/dL)	3.30 mg/dL			
Blood Urea Nitrogen (BUN) (7.00 to 18.0 mg/dL)	7.5 mg/dL ⇓ Renal Profile inconclusive due to Protein (N_2) ⇓ deficiency			
Cystatin C (0.53 to 0.95 mg/L) Optimum ≤ 0.7 mg/L	0.76			
Daily Protein Intake RDA = 1 g/Kg Body Weight	Protein deficiency, Nitrogen Imbalance N_2 ⇓			

Falling blood pressure or heart rate ⇓ on exercising indicates poor Cardiac Efficiency (serious intracellular magnesium deficiency).

* Prior to starting detoxification and magnesium supplements. H/o first degree hypertension detected 6 years earlier. But patient has refused to take anti-hypertensive prescription medication recommended by her family physician.

** After 5 weeks of complete body detoxification and rejuvenation with intracellular magnesium supplements.

*** After 14 weeks of intracellular magnesium supplementation and completion of a 8 week standard whole body detoxification and rejuvenation program.

Table 5 - Case Study No. 3
Reversal of Primary Hypertension

Note:

Care should be taken when attempting to monitor Blood Pressure and Heart Rate that the patient is not dehydrated or has not taken any water during the last 3 or 4 hours. Dehydration typically causes the heart rate to rise significantly. A give away is the warmth of the hand when putting on the cuff of the blood pressure machine. If the body feels unduly warm it is a clear indication of dehydration and the heart rate you are going to measure is going to be significantly higher than it normally should be and in many case the blood pressure will also be a little lower. If this happens, ask the patient to take one or two glasses of water and wait about 15 to 30 minutes before measuring the blood pressure and heart rate.

Patient: Female, Age: 61, Height: 5ft 1 in., Weight: 135.2 lbs. (61.454 Kg.), Fat = 36.9% (+), BP = 164 / 97, Pulse = 82, BPs = 178 / 103 Pulse = 92 bpm Diet: Vegetarian (H/o Diabetes) (Ref: SR) with Rx for Hypertension = Amlodipine 5.0 mg + Metoprolol ER 50.0 mg with Rx for Diabetes = Gliclazide 80 mg + Metformin HCl 500 mg				
Cardiac Profile (Standard Reference Range)	* 12/06/2010	** 02/09/2011	*** 03/12/2011	**** 04/12/2010
Blood Pressure (BP) (110/70) & Heart Rate (P) (70)	# BP = 164/97 P = 82 w/Rx	BP = 132/77 P = 75	BP = 135/74 P = 64	BP = 130/81 P = 81
Standing Blood Pressure (BPs) Standing Pulse (Ps)	BPs = 178/103 Ps = 92	BPs = 137/86 Ps = 79	BPs = 148/86 Ps = 70	BPs = 141/83 Ps = 87
Heart Rate (Standing) Ps bpm	Ps = 92	Ps = 79	Ps = 70	Ps = 87
Risk Profile	Very High BP not responding to Rx	High BP responding poorly to Rx	High BP responding poorly to Rx	Moderate Rx reduced to Amlodipine 5.0 since 30 days
Cardiac Efficiency	"Poor" Uncontrolled Blood Pressure	"Poor" Blood Pressure still high	"Poor" Blood Pressure still high	Fair
Renal Profile (Std. Reference Range)	* 12/07/2010			
Serum Creatinine (0.6 to 1.4 mg/dL)	0.7 mg/dL			
Serum Uric Acid (2.6 to 6.0 mg/dL)	3.30 mg/dL			
Blood Urea Nitrogen (BUN) (7.00 to 18.0 mg/dL)	13.0 mg/dL			
Cystatin C (0.53 to 0.95 mg/L) Optimum ≤ 0.7 mg/L				
Daily Protein Intake RDA = 1 g/Kg Body Weight	Good Nitrogen N_2 Balance			
Blood / Urine Sugar	## 12/07/2010		## 04/11/2011	## 05/07/2011
Fasting Blood Sugar	267 mg/dL		155 mg/dL	140 mg/dL
Fasting Urine Sugar	Detected (+++)		Absent	Absent
Post Prandial	356 mg/dL		190 mg/dL	170 mg/dL
PP Urine Sugar	Detected (+++)		Absent	Absent

Blood pressure not responding to antihypertensive prescription drugs (amlodipine 5.0 mg + metoprolol ER 50.0 mg) indicates high cardiac risk profile. The prognosis is a stroke and / or kidney failure some time in the near future. Coupled with a history of diabetes, it is an indication of a serious intracellular magnesium deficiency.

Rx for Diabetes = Gliclazide 80 mg + Metformin HCl 500 mg (½ - ½ - 1)

* Prior to starting detoxification and magnesium supplementation. First degree hypertension and type 2 diabetes was detected 15 years earlier.

** After 8 weeks of complete body detoxification and rejuvenation with intracellular magnesium supplements. Blood pressure and heart rate finally responding to prescription medication.

*** After 12 weeks of intracellular magnesium supplementation and completion of a standard complete body detoxification and rejuvenation program. Due to falling heart rate metoprolol ER 50 mg has been discontinued on an experimental basis to prevent bradycardia. Patient only to take amlodipine 5.0 mg

**** After 16 weeks of intracellular magnesium supplementation and after 30 days of reduce Rx of amlodipine 5.0 mg we see a slight fall in systolic blood pressure. There is also a much better blood sugar control without any increase in anti-diabetic prescription medication. Situation to be reassessed on a monthly basis to ensure patient does not develop hypotension or low blood sugar due to present dose level of diabetic Rx.

Table 6 - Case Study No. 4
Reversal of Primary Hypertension in Patient With Type 2 Diabetes

Patient: Male, Age: 41, Height: 5ft 10 in., Weight: 214.2 lbs. (97.363 Kg.), Fat = 26.8% (++), BP = 136 / 85, Pulse = 92, BPs = 149 / 88 Pulse = 92 Diet: Meat Eater (H/o One Kidney) (Ref: AlfGir) with Rx = Losartan 50 mg + Hydrochlorothiazide (HCTZ) 12.5 mg				
Cardiac Profile (Standard Reference Range)	* 06/10/2010	** 09/14/2010	*** 12/16/2010	**** 03/10/2011
Blood Pressure (BP) (110/70) & Heart Rate (P) (70)	# BP = 136/85 P = 92 w/Rx	BP = 115/74 P = 78	BP = 122/77 P = 87	BP = 127/86 P = 77
Standing Blood Pressure (BPs) Standing Pulse (Ps)	BPs = 149/88 Ps = 92	BPs = 141/81 Ps = 95	BPs = 138/87 Ps = 89	BPs = 142/95 Ps = 79
Heart Rate (Standing) Ps bpm	Ps = 92	Ps = 95	Ps = 89	Ps = 79
Risk Profile	Very High BP & Heart Rate not responding to Rx	High BP & Heart Rate responding poorly to Rx	Fair BP & Heart Rate controlled w/o Rx for 40 days	Moderate Rx stopped since 120 days
Cardiac Efficiency	"Poor" Uncontrolled Blood Pressure & Heart Rate	"Poor" Heart Rate still on higher side	"Poor" Heart Rate still on higher side	"Poor" Heart Rate does not rise on exertion
Renal Profile (Standard Reference Range)	05/20/2008	01/21/2009	* 06/15/2010	**** 03/12/2011
Serum Creatinine (0.6 to 1.4 mg/dL)	1.3 mg/dL	1.4 mg/dL	1.50 mg/dL ⇑	1.39 mg/dL
Serum Uric Acid (2.6 to 7.2 mg/dL)	6.6 mg/dL		6.30 mg/dL	5.50 mg/dL
Blood Urea Nitrogen (BUN) (7.00 to 18.0 mg/dL)	13.0 mg/dL		16.20 mg/dL	19.30 mg/dL ⇑
Cystatin C (.53 to 0.95 mg/L) Optimum ≤ 0.7 mg/L				0.76 mg/L ⇑
Daily Protein Intake RDA = 1 g/Kg 0Body Weight	Protein Sufficiency Good N_2 levels		Protein Sufficiency Good N_2 levels	Excessive Proteins High N_2 levels

\# Blood pressure and heart rate not responding to antihypertensive prescription drugs indicates very high cardiac risk profile. Coupled with a history of one kidney since childhood and chronic hypertension detected about 12 years earlier, the prognosis is a stroke and / or kidney failure some time in the near future. This is an indication of a serious intracellular magnesium deficiency.

* Prior to starting detoxification. History of one kidney since childhood. High serum creatinine detected about 12 years back when it was around 1.4 mg/dL.

** After 12 weeks of complete body detoxification and rejuvenation with intracellular magnesium supplements. Through dietary corrections (avoiding red meats and reducing carbohydrates and sugars) weight has been brought down to 197.0 lbs (89.545 Kg) and body fat to 25.1% (+). This is 1.7% ⇓ reduction in body fat.

*** After 24 weeks of intracellular magnesium supplementation and completion of a standard 8 week complete body detoxification and rejuvenation program. Fair blood pressure and heart rate control achieved with losartan 25 mg + HCTZ 6.25 mg since September 15th and without losartan 50 mg + HCTZ 12.5 mg since middle November (the past 40 days). No further weight / body fat reduction.

**** After 36 weeks: Good blood pressure and heart rate control achieved without antihypertensive prescription drugs since the past 120 days. Gradual reduction in serum creatinine to mid 2008 levels and reduction of serum uric acid from 6.6 to 5.5 mg/dL is an indication of the extent of repairs carried out to the only existing kidney in the body. No further weight / body fat reduction.

Table 7 - Case Study No. 5
Reversal of Primary + Secondary Hypertension in Patient With Renal Insufficiency, Only one Kidney and History of Obesity - Body Fat = 26.8%(++)

Patient: Male, Age: 51, Height: 5ft 9 in., Weight: 218.6 lbs. (99.363 Kg.), Fat = 29.0% (++), BP = 123 / 75, Pulse = 77, BPs = 113 / 82 Pulse = 80 Diet: Predominantly Vegetarian (Ref: AvGu) H/o Smoking, Alcohol and Obesity (Very High Body Fat / Weight) with Rx = Telmisartan 40 mg + Atenolol 25 mg + Amlodipine 5.0 mg				
Cardiac Profile (Standard Reference Range)	* 07/06/2010	** 10/23/2010	*** 02/24/2011	**** 04/08/2011
Blood Pressure (BP) (110/70) & Heart Rate (P) (70)	# BP = 123/75 P = 77 w/Rx	BP = 124/75 P = 82	BP = 119/79 P = 77	BP = 121/81 P = 75
Standing Blood Pressure (BPs) Standing Pulse (Ps)	BPs = 113/82 Ps = 80	BPs = 115/77 Ps = 85	BPs = 116/82 Ps = 79	BPs = 120/84 Ps = 78
Heart Rate (Standing) Ps bpm	Ps = 80	# Ps = 85	# Ps = 79	# Ps = 78
Risk Profile	Very High BP controlled only through heavy Rx: Telmisartan 40mg + Atenolol 25 mg + Amlodipine 5 mg	High Rx reduced: Telmisartan 20mg since 35 days + Atenolol 25 mg + Amlodipine 5 mg	High Rx reduced: w/o Telmisartan since 120 days + Atenolol 25 mg + Amlodipine 5 mg	Moderate Rx reduced: w/o Telmisartan since 120 days + Atenolol 12.5 mg + Amlodipine 2.5 mg for 30 days
Cardiac Efficiency	"Poor" Blood Pressure controlled with Rx	"Poor" Blood Pressure controlled with Rx	"Poor" Heart Rate does not increase on exertion	"Fair" Blood Pressure & Heart Rate do not increase on exertion
Renal Profile (Standard Reference Range)	## 12/08/2007	## 11/28/2009		
Serum Creatinine (0.6 to 1.4 mg/dL)	1.0 mg/dL ⇑	1.0 mg/dL ⇑		
Serum Uric Acid (2.6 to 6.0 mg/dL)	4.5 mg/dL	6.0 mg/dL ⇑		
Blood Urea Nitrogen (BUN) (7.00 to 18.0 mg/dL)	10.3 mg/dL	10.0 mg/dL		
Cystatin C (0.53 to 0.95 mg/L) Optimum ≤ 0.7 mg/L				
Daily Protein Intake RDA = 1 g/Kg Body Weight	Protein deficiency, Nitrogen Imbalance N_2 ⇓	Protein deficiency, Nitrogen Imbalance N_2 ⇓		

\# Blood pressure and heart rate are responding only to very heavy antihypertensive prescription drugs taken since last 13 years. This indicates a very high cardiac risk profile. The Liver Function Test and Renal Profile of the patient show "Hepatic and Renal Impairment" caused due to the very prolonged use of numerous antihypertensive drugs. It is therefore recommended that alternative mode of blood pressure and heart rate control be explored at this stage to prevent any further deterioration of liver and kidney function.

History shows gradually increasing serum uric acid levels from 4.5 mg/dL in December 2007 to 6.0 mg/dL in Nov 2009 pointing to renal impairment due to prolonged exposure to numerous antihypertensive prescription medications taken in the past.

* Prior to starting detoxification. History of hypertension since more than13 years. This is an indication of a serious intracellular magnesium deficiency. Treatment started middle of August 2010.

** After 8 weeks of complete body detoxification and rejuvenation with intracellular magnesium supplements.

*** After 24 weeks of intracellular magnesium supplementation and extended kidney detoxification program.

**** After 30 weeks of intracellular magnesium supplementation. No reduction in smoking (5 cigarettes per day), alcohol use (2 pegs twice or thrice a week) and reduction in body weight / fat has been implemented so far. Reduction in dependence on Rx has been solely achieved through kidney detoxification and intracellular nutrition.

Table 8 - Case Study No. 6
Reversal of Primary + Secondary Hypertension in
Patient with Drug Induced Renal + Hepatic Impairment
and History of Smoking, Alcohol use and Obesity - Body Fat = 29.0%(++)

What is Intracellular Nutrition?

To understand the why and how of intracellular nutrition, let me explain a few important factors.

1. With the over cultivation of the land and the consequent falling nutritional value of the soil and hence of the food we eat, the human body has during the last 50 years progressively become malnourished. This has given rise to chronic aliments of all types. A method must be found to correct this deficiency in a very short span of time – few weeks or a few months. For more info: www.space-age.com/nutri-farm-seminar.doc
2. To achieve this
   a) One must be able to administer nutrition in an organic form in therapeutic doses. Prophylactic doses presently available at the local pharmacy, chemist or health food store cannot however find any use here.
   b) The doses administered must reach the intracellular space i.e. the center of the cell where nutrition is really required and not just the serum level as most prophylactic nutritional doses do.
   For more info: www.space-age.com/Multivitamin-FAQs.doc

To achieve this, one must have at one's command two technologies:
1) a capacity to alter cell membrane permeability; and
2) a carrier mechanism to carry nutrition to the center of the cell where it is required.

Let me explain the need for this in more simple terms.

Imagine, a time few hundred years ago, a soldier on horseback with a sword in his hand outside the thick walls of a fortress. By himself, the soldier will not be able to penetrate the thick walls of the fort. Now imagine canon balls being fired at the thick walls of the fort. These canon balls will soon create an opening in the walls of the fort through which the soldier will now be able to enter the fortress.

The canon balls have changed the permeability of the walls of the fortress. The horse is the carrier mechanism to help carry the soldier inside the fort. The soldier is the nutrition.

Orthomolecular nutrition when equipped with cell membrane permeability altering capabilities and further equipped with a carrier mechanism to easily carry the nutrition inside the cell to its center is the basis of intracellular nutrition.
For info: www.space-age.com/Multivitamin-FAQs.doc

Now, we couple this with therapeutic doses of nutrition, which when correctly administered in a synergetic manner at intracellular levels, can help to free the body of chronic aliments like hypertension, diabetes, hormone imbalance, along with its connected diseases like hypothyroidism, prostate enlargement / inflammation and obesity. It can also help to repair hardened arteries, improve

the left ventricular ejection fraction (LVEF) of the heart and also repair minor damages to various other organs of the body with a fair degree of accuracy.

Which magnesium to use and which not to use?

Do not use prophylactic dose of magnesium to correct intracellular magnesium deficiency. It is also not recommended to use inorganic magnesium salts like magnesium sulfate (also known as Epsom salts), magnesium chloride, magnesium hydroxide, magnesium oxide as these are not retained in the body and are readily excreted within a few hours of ingestion . Magnesium sulfate is also a strong laxative and cannot be administered at therapeutic dose levels. To be absorbed and retained in the body, magnesium must be in an organic form like a ascorbate, lactate, orotate, gluconate, etc. Elemental magnesium has to be coupled with a carrier mechanism to carry nutrition to the center of the cell where it is essentially required and with a cell membrane permeability enhancing mechanism to allow its easy passage to the center of the cell. In addition, magnesium must have other supporting nutrients which work in a synergistic manner. This is a special formulation designed to effectively alter intracellular magnesium levels and will not only be readily absorbed by the body, but also retained for prolonged periods to achieve a therapeutic effect, required to treat chronic diseases like hypertension or type 2 diabetes.

For more information on Orthomolecular Medicine + Orthomolecular / Intracellular Nutrition and how it is different from prophylactic doses of nutrition which works only at serum levels, please go to Appendix III Pages 44 to 48.

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Appendix I - Part A

Reproduced below is an extract taken from:
(with my parenthetical commentary in italics where I found the need to amplify and clarify)

Murray, Michael T. Encyclopedia of Nutritional Supplements. Roseville: Prima Publishing, 1996. ISBN 0-7615-0410-9

Pages 159 - 175

Magnesium Deficiency Signs and Symptoms

"Magnesium deficiency is extremely common in Americans, particularly in geriatric population and in women during the premenstrual period. Deficiency is often secondary to factors that reduce absorption or increase secretion of magnesium, such as high calcium intake, alcohol, surgery, diuretics, liver disease, kidney disease, and oral contraceptive use."

(Note- The words "extremely common" and " magnesium deficiency" is a direct result of high calcium intake. Excessive calcium intake is a prevalent health issue in our society since a very long time. This was known to nutritional scientist since a few decades).

"Low levels of magnesium in the diet and in our bodies increases susceptibility to a variety of disease, including heart disease, high blood pressure, kidney stones, cancer, insomnia, PMS, and menstrual cramps. Signs and symptoms of magnesium deficiency are fatigue, mental confusion, irritability, weakness, heart disturbances, problems in nerve conduction and muscle contraction, muscle cramps, loss of appetite, insomnia, and predisposition to stress."

(It is important to note here the potential risk associated with low levels of magnesium in the form of increased susceptibility to kidney stones and various cardiac diseases, such as hypertension).

"Low magnesium levels are common in the elderly, but most cases go unnoticed because most physicians rely on serum magnesium levels to indicate magnesium levels. Most of the body's magnesium store lies within cells, however, not in the serum (noncellular portion of blood). A low magnesium levels in the serum reflects end-stage deficiency. A more sensitive test of magnesium status is the level of magnesium within the red blood cell (erythrocyte magnesium level)."

(*The concept conveyed here is that the serum tests doctors rely on contributes to an undiagnosed magnesium deficiency*).

"Some of the conditions associated with or causing magnesium deficiency are:

- Acute pancreatitis
- Congestive heart failure
- Dietary deficiency
- Digitalis toxicity
- Excessive sweating
- Impaired intestinal absorption
    - Chronic diarrhea
    - Ileal resection
    - Malabsorption syndromes

- Increase magnesium loss through the kidneys
    - Diuretic use
    - Diabetes
    - Antibiotics
    - Alcohol
    - Hyperthyroidism
    - Kidney disease"

(Congestive heart failure is due to a case of serious magnesium deficiency. Mostly, it is an end stage deficiency as referenced in an earlier paragraph. An end stage deficiency is usually one in which it is too late to remedy the condition. Magnesium shots are usually administered in the ICU as a last resort. For some strange reason, once the patient leaves the ICU, magnesium is forgotten!).

Principal Uses

"Magnesium supplementation is effective treatment for a large number of health conditions. While some studies utilize injectable magnesium therapy, other demonstrate that injectable magnesium is not necessary to restore magnesium status (except in the case of an emergency situation such as an acute heart attack or acute asthma attack)"[1]

(*Magnesium is useful to save someone who has suffered an acute myocardial infarction. If magnesium can be effective here, then it can be argued that magnesium can also be used to prevent myocardial infarction and to treat myocardial ischemia and angina pectoris*).

"Oral magnesium therapy is an effective measure to raise body magnesium stores. It usually takes 6 weeks to achieve significant elevations in tissue magnesium concentrations."

"These are some conditions which benefit from magnesium supplementation:

- Asthma and chronic obstructive pulmonary disease
- Cardiovascular disease
- Acute myocardial infarction

- Angina
- Cardiac arrhythmias
- Cardiomyopathy
- Congestive heart failure
- High blood pressure
- Intermittent claudication
- Low HDL-cholesterol levels
- Mitral valve prolapse
- Stroke
- Diabetes
- Eosinophilia-myalgia syndrome
- Fatigue
- Fibromyalgia
- Glaucoma
- Heating loss
- Hypoglycemia
- Kidney stones
- Migraine
- Osteoporosis
- Pregnancy (toxemia, premature delivery, and other complications)
- Premenstrual syndrome and dysmenorrheal"

(*Magnesium is used to treat osteoporosis and a large number of heart conditions. As we will read about in the next section, high blood pressure is one of the most important condition which responds to magnesium therapy*).

High Blood Pressure

"Population studies correlate a high magnesium intake with lower blood pressure. The principle source of magnesium in early studies was water. Water high in minerals is often referred to as "hard water." Numerous studies demonstrate that an inverse correlation between water hardness and high blood pressure exists. In other words, where magnesium content of water is high, there are fewer cases of high blood pressure and heart disease."[2]

"Early studies led to more extensive dietary studies that explored the association of magnesium and high blood pressure. These dietary studies found the same results as the hard water studies – when magnesium levels are high, blood pressure is lower. In one of the most extensive studies, the Honolulu Heart Study, systolic blood pressure was 6.4 millimeters of mercury lower and diastolic blood pressure 3.1 millimeters of mercury lower in the highest magnesium intake group compared to the lowest magnesium intake group."[3]

"Because of the epidemiological evidence, researchers began investigating the effect of magnesium supplementation in the treatment of high blood pressure.

The results are mixed. Some of the studies show a very good blood pressure-lowering effect, others do not. Whether or not magnesium supplementation will lower blood pressure depends on several factors. First, if the individual is taking a diuretic, there is a very good chance that magnesium supplementation will lower blood pressure by overcoming the magnesium depletion the diuretic induces. Another scenario where magnesium supplementation may be valuable is when the high blood pressure is associated with a high level of rennin, an enzyme release of aldosterone. These compounds cause the blood vessels to constrict and the blood pressure to increase. Finally, patients with elevated intracellular sodium or decreased intracellular potassium (measured by red blood cell studies) respond better to magnesium supplementation then subjects with normal intracellular potassium and sodium levels. Rather that performing a blood test to measure rennin or intracellular potassium and sodium, I recommend giving magnesium supplementation a 4-week trial. I also recommend consuming a high-potassium diet." [3]

(The author places emphasis on a better response with "patients with elevated sodium." Since magnesium deficiencies affect a large population today, it stands to reason that once this deficiency is corrected, sodium will not raise blood pressure but may actually help lower it. It can be argued then to conduct studies to find out the effect of dietary salt on high blood pressure, the variable of magnesium deficiency must be first removed and nutritional profiles of the patients brought to healthy levels. Only then will we be able to get consistent and conclusive results).

"There are a number of studies that show magnesium supplementation is of value in lowering blood pressure. In one double-blind study, 91 middle-aged and elderly women with mild to moderate high blood pressure (between 140/90 and 185/105) who were not on blood pressure-lowering drugs randomly received either 480 milligrams of magnesium (as magnesium aspartate) or a placebo each day for 6 months. At the end of the study, systolic blood pressure dropped 2.7 millimeters of mercury and diastolic blood pressure dropped 2.7 millimeters of mercury more in the magnesium group than in the placebo group. The result was a near-normal average blood pressure reading of 143.8/86. Potassium supplementation did not produce any side effect, nor did the magnesium aspartate cause diarrhea."[4]

"In another double-blind clinical study, 21 male patients with high blood pressure were given 600 milligrams of magnesium daily (as magnesium oxide) or a placebo. Mean blood pressure (the average between the systolic and diastolic) decreased from 111 to 102 millimeters of mercury. Several other findings are worth mentioning. The patients who responded the best were those with increase red blood cell sodium and reduced red blood cell potassium. After therapy with magnesium, the levels of intracellular sodium, potassium, and magnesium normalized, which suggests magnesium lowers blood pressure through activation of the cellular membrane pump that pumps sodium out of, and potassium into the

cell. Magnesium supplementation also lowers triglycerides from 102 to 82 milligrams per deciliter and total cholesterol from 195 to 184 milligrams per deciliter."[5]

Dosage Ranges

"Many nutritional experts feel the ideal intake of magnesium should be based on body weight (6 milligrams per 2.2 pounds body weight). For a 110 pound person, they recommend 300 milligrams; for a 154 pound person, 420 milligrams; and for a 200 pound person, 540 milligrams. Rather than relying on dietary intake to achieve this amount of magnesium, for most people I recommend supplementing their diets with additional magnesium corresponding to the recommendation fo 6 milligrams per 2.2 pounds body weight. For the conditions discussed above, I usually recommend twice this amount - 12 milligrams per 2.2 pounds body weight."

(Note with every passing decade, the depletion of nutrients in the soil only gets larger, as we do not allow floods to come and remove the spent top soil. We build dams to prevent floods that can economically remove the spent top soil and take it to the oceans. We build dams to generate electricity at the cost of health! As the soil gets depleted, with each passing decade the doses required to correct these ever increasing deficiencies will only get larger).

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Appendix I - Part B

Reproduced below is an extract taken from:
(with my parenthetical commentary in italics where I found the need to amplify and clarify)

Werbach, Melvyn R., M.D., Assistant Clinical Professor, UCLA School of Medicine, Los Angeles, CA, Textbook of Nutritional Medicine. Third Line Press, Inc., 1999. ISBN 0-9618550-9-6

Pages 38 to 39

Magnesium
"Chronic primary magnesium deficit, which is estimated to be present in 15 to 20 % of the population, is the most common form of magnesium deficiency."[1]

(Durlach estimate of chronic primary magnesium deficit was published in 1994. Today, this estimate is much higher. My estimate, based on thousands of blood reports seen in the last decade, is that more than 60% of the population today has very severe magnesium deficiency by the age of 50, which is further confirmed by manifestation of symptoms of hypertension. This percentage goes up to 75% as the by the age of 75 years. This is due to over cultivation of the land and the use of synthetic fertilizers. The soil is totally depleted of minerals. There are figures on the "shrinking values of nutrition" released by USDA to validate this).

"Cardiac symptoms are not uncommon and include symptoms of idiopathic mitral valve prolapse, palpitations, extrasystoles and dysrhythmias. Muscle symptoms, primarily painful cramping and involuntary fasciculations (twitches), are a frequent manifestation. In the hands and feet, there may be acroparesthesias ("pins and needles" sensations in the hands and feet) as well as Raynaud's syndrome (vasospasm causing the digits to turn a reddish-purple and to feel cold, numb and sometimes painful)."

(A lot of cardiac diseases are actually linked to magnesium deficiency).

Hypertension (Pages 420 to 425)

Minerals
Hard versus Soft Water

"While the results of studies are mixed, most show that hard water is associated with lower blood pressure levels than soft water. Since absorption of elements in drinking water is usually twice that of foods (as there are no chelating agents

present), they may have a greater influence, even though the concentrations of these elements is usually small in relation to that in the food."

"Water hardness is usually caused by dissolved calcium and magnesium although, in a few areas, hardness may also result from iron or aluminum salts. The beneficial influence of water hardness may be from alkalinity or from competition between divalent ions. Toxic elements, such as cadmium and lead (see Cadmium and Lead below), may be leached from pipes in soft water areas because of low pH. Also, the intestinal absorption of cadmium and lead may be retarded by the presence of competing ions in hard water, i.e. calcium and magnesium*."* [2]

Salt (sodium chloride)

"Even through public health policy emphasizes sodium restriction as its principal recommendation, experts continue to debate sodium's role in arterial blood pressure control*."* [3]

"A large meta–analysis of randomized controlled trials recently concluded that the evidence in the normotensive population does not support current recommendations for universal sodium restriction." [4]

(When you take a group of normotensive people, it is most likely that in a very large majority of these people, that they were not terribly deficient in magnesium. If we were to begin with a population of people with corrected magnesium levels, and other nutrient profiles in the first place, there would be no merit to the hypothesis that salt causes an increase in blood pressure. I am sure that there may not be a single case study done so far where the data on magnesium deficiency at serum and intracellular levels was actually logged prior to beginning the study to show the effect of salt on raising blood pressure).

"Moreover, salt intake cannot usually be restricted successfully below 5g daily on a long-term basis." [5]

"It does appear that moderate salt restriction (2 to 5g daily) may result in about 5 mm Hg decline, on average, in both systolic and diastolic blood pressures for perhaps half of the total population." [6, 7]

(It is important to note that approximately half the population had adequate levels of magnesium, so salt helped to lower their blood pressure).

"Another estimate is that 30% of the general public, and 40 to 50% of hypertensives, are salt-sensitive." [8, 9]

(The groups that were sensitive were those that were magnesium deficient).

“Conversely, in a small minority of people, moderate sodium restriction may actually increase blood pressure.” [6]

“Other research suggests that certain populations, such as African-Americans, the elderly, and diabetics, may have a relatively high prevalence of salt sensitivity. However, the salt sensitivity noted in these groups appears to be more related to decreased ingestion of calcium and potassium than to excessive salt intake.” [10]

“Low Magnesium intake may also be a cause of salt sensitivity.” [11]

(Finally we see a study that examines the importance of studying magnesium prior to studying the effect of salt on high blood pressure).

“Short-term, very-low-salt diets appear to be contraindicated in patients at risk for hypertension along with hyperinsulinemia / insulin resistance (“syndrome X”). Such patients have raised concentrations of rennin and aldosterone, and salt restriction results in further increases in these variables.” [12]

(Note for the sake of uniformity, it is better not to reduce salt intake for all types of patients including those with very high insulin levels which are encountered in type 2 diabetes patients due to insulin resistance).

“Since most of the data suggesting a link between salt intake and blood pressure comes from epidemiologic studies, long-term, large-scale clinical trials are still needed to resolve this lingering controversy.”

(For such trials to make sense, the magnesium and other nutritional deficiencies need to be corrected before the clinical trials are begun to resolve this lingering controversy).

“Salt intake, however, is believed to be primarily responsible for determining how much calcium is excreted. In fact, within the usual ranges of salt and calcium intake, salt intake is more important than calcium intake in determining urinary calcium excretion. Increased urinary calcium excretion due to a high salt intake may not be adequately compensated for by increase calcium absorption; thus calcium may be reabsorbed from bone in order to maintain calcium homeostasis.” [13, 14]

“Because of the importance of calcium in blood pressure regulation (see Calcium below), excess sodium intake may contribute to hypertension via its effect on calcium levels. This suggests that decreasing a high sodium intake is most likely to be effective when accompanied by an increase in a low calcium intake.” [15]

(Pages 424 – 425)

Magnesium Deficiency
"Magnesium is a potent vasodilator." [16]

(Magnesium in this capacity can help lower blood pressure)

"A low magnesium concentration reduces production of prostacyclin (a vasodilating, anti-aggregating prostanoid), and increase release of thromboxance (a vasoconstricting, platelet-aggregating prostanoid). Other endothelial derivatives (endothelium-derived relaxing factor [nitric oxide], endothelin, and fibronectin) may also be affected." [17]

"Dietary magnesium intake is inversely related to both systolic and diastolic blood pressure." [18]

(We observe more evidence in support of magnesium inversely related to lowering blood pressure)

"In one study, low magnesium intake was the strongest of 61 dietary variables in predicting hypertension." [19]

(Further evidence supporting the role of magnesium in lowering hypertension).

"In fact, half of all patients suffering form magnesium depletion are hypertensive and, once their deficiency is corrected, blood pressure returns to normal." [20]

(Further evidence supporting the role of magnesium in lowering hypertension).

"Although the results are conflicting, serum,[18] urinary, [21] Ionized, [17] Lymphocyte, [22] and erythrocyte free[23] magnesium have all been reported to be low in hypertensives."

(The take home message here is that no salt studies should be carried out without first correcting intracellular levels of magnesium. Otherwise, the results will be misleading. We need to disregard all such papers published without first correcting the magnesium and nutritional profile of each participant in such clinical trials).

Supplementation
"The findings have not been entirely consistent, yet magnesium supplementation has repeatedly been demonstrated to lower blood pressure in hypertensives under double-blind conditions." [24, 25]

"Moreover, supplemental magnesium can reduce blood pressure in normotensives with type I, [26] *or* type II [27] diabetes. Also, potassium and magnesium supplementation together have been found to be more effective than potassium alone in restoring the anti-hypertensive efficacy of diuretics." [28]

"Inconsistent results from clinical trials may be because supplementation only appears to be of value when the patient is magnesium-deficient.[29]

(Today, magnesium deficiency is found in the majority of the population due to depletion of soil nutrition, as already noted in the Shrinking Value of Nutrition" reported by the USFDA).[30]

"Since magnesium deficiency is associated with the loss of cellular potassium,[31] *it may be wise to increase potassium intake when evidence of magnesium deficiency is found."*

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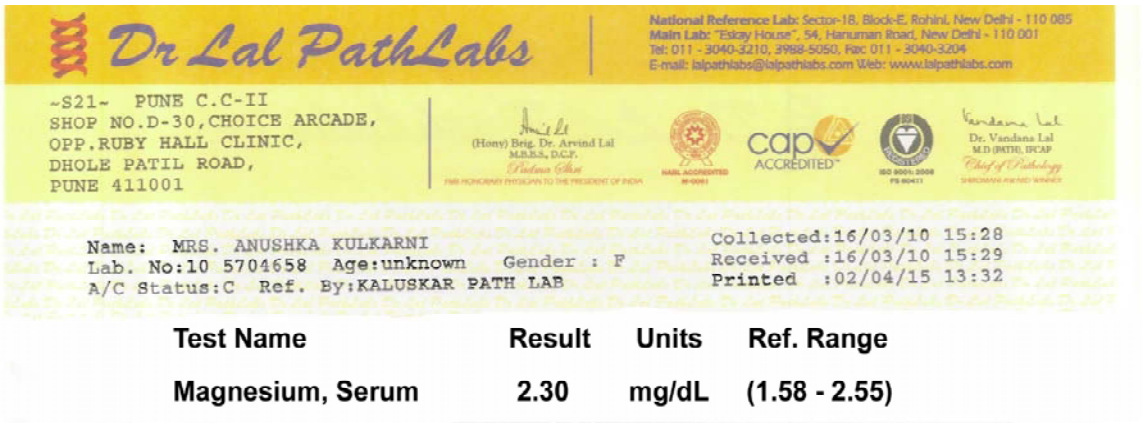
Appendix II - What Pathologists Say - Serum Magnesium



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Name: MRS. ANUSHKA KULKARNI
Lab. No:10 5704658 Age:unknown Gender : F
A/C Status:C Ref. By:KALUSKAR PATH LAB

Collected:16/03/10 15:28
Received :16/03/10 15:29
Printed :02/04/15 13:32

Test Name	Result	Units	Ref. Range
Magnesium, Serum	2.30	mg/dL	(1.58 - 2.55)

Interpretation of Serum Magnesium Test

- **Comments:**
- **Magnesium is the fourth most abundant cation in the body and is second only to potassium within cell. It is stored in bones, skeletal muscles and other cells and only a part in extracellular fluid. Mg 2+ is a cofactor of many enzyme system concerned with cell respiration, glycolysis, transmembrane transport of other cations such as calcium and sodium. The activity of Na- K- ATPase depends on magnesium. Assessment of magnesium levels are used for the diagnosis and monitoring hypo-magnesemia or hypermagnesemia.**

- **Magnesium is the fourth most abundant cation in the body of which 50-60 % is in the bone and remaining 40-50 % is in soft tissues. Magnesium is essential for the function of > 300 cellular enzymes. Hypermagnesemia is rare and usually iatrogenic occurring in elderly and patients with bowel disorders or renal insufficiency. Hypomagnesemia is found in approximately 11% of hospitalized patients.**

- **Magnesium deficiency leads to impairment of neuromuscular functions resulting in hyperirritability, tetany, convulsion or electrocardiographic changes. It is**

also associated with cardiovascular diseases such as hypertension, myocardial infarction, cardiac dysrhythmias, coronary vasospasm & premature atherosclerosis. Diabetic ketoacidosis, chronic alcoholism, malnutrition, lactation malabsorption are other conditions linked with it.

- **Increased serum magnesium concentration has been observed in dehydration, Addison disease, rhabdomyolysis or acute or chronic renal failure.**

Magnesium Interpretation

Adapted from Tietz text book – Fundamentals of clinical chemistry 6 th edition.

Serum Magnesium Test

Test Name	Result	Units	Ref. Range
Magnesium, Serum	2.30	mg/dL	(1.58 – 3.00)

Optimum Value ≥ 2.40 mg/dL

BLOOD - EXAMINATION

BLOOD UREA LEVEL	**:**	**28 mg/dl**	**(N - 10 to 40)**
SERUM CREATININE	**:**	**1.3 mg/dl**	**(N - Male 0.9 - 1.5)**
AU. ANTIGEN	**:**	**NEGATIVE**	

Note Added:

(The above Serum Magnesium value of 2.30 mg/dL may be falsely elevated since some renal insufficiency is seen as Serum Creatinine is at an elevated 1.3 mg/dL against an Optimum Value of 0.8 mg/dL)

Appendix III - Orthomolecular / Intracellular Nutrition - FAQs

Q1.
What is Orthomolecular Medicine or Intracellular Nutrition?
Answer:
Orthomolecular Medicine is a concept created by Nobel Laureate Linus Pauling in 1968. Linus Pauling used high doses of vitamin C for the treatment of the common cold. Such high doses of vitamin C were later on also used by him for other illnesses. In 1968, he postulated that people's needs for vitamins and other nutrients vary markedly and that to maintain good health, many people need amounts of nutrients much greater than the Recommended Dietary Allowances (RDAs). He further postulated that megadoses of certain vitamins and minerals are the treatment of choice for some forms of mental illness. For this science, he coined the term "orthomolecular," meaning "right molecule." After that, he steadily expanded the list of illnesses that could be influenced by "orthomolecular" therapy and the number of nutrients suitable for such use. Thus the science of Orthomolecular Medicine was born.

Q2.
What is nutrition?
Answer:
Nutrition is the use of vitamins and minerals identical to those found in the human body. Some of the important vitamins are A, B-Complex, C, D, E and K. Some of the important minerals are Calcium, Iron, Zinc, Magnesium, Manganese, Chromium, Selenium, Sodium, Potassium, Phosphorous, etc.

Q3.
Why is nutrition so important for good health?
Answer:
Due to the over cultivation of land and the use of synthetic fertilizers, the nutrition in the soil has been depleted to the point where the nutrition in our food supply has greatly diminished and presently is approximately just 25% of what it was 50 years back. These are the finding of the US Department of Agriculture (USDA) and are similar to the situation presently being encountered all over the world. This has resulted in a host of chronic diseases worldwide.

Q4.
How is normal nutrition different from Orthomolecular Nutrition?
Answer:
Normal nutrition, as is found in supplements in health food stores and pharmacies for example, has lower (prophylactic) doses of vitamins and minerals, which temporarily affect the blood serum level and are readily excreted by the body. These are mainly inorganic in nature and not identical to those found in the human body. Hence, these do not have any lasting effect on the human body and are not optimized to alter nutritional levels inside the cell wall (intracellular spaces / levels).

On the other hand, Orthomolecular Nutrition comprises of prescription strength doses of organic minerals and vitamins which have a therapeutic effect on the human body and are optimized to alter intracellular levels of nutrition – this is where the nutrition is really required. These type of nutrients are not only readily absorbed, but are also retained by the human body for extended periods of time. Once nutritional levels are correct inside a cell, they have a more lasting effect and this can help to reduce the severity of a lot of chronic diseases, which are aggravated due to nutritional deficiencies.

Altering intracellular nutritional levels is very difficult to achieve. It requires the use of nutrients in a synergistic manner, be organic in nature and at therapeutic dose levels. These nutrients are optimized to quickly alter nutrition inside the cell wall and are hence know as intracellular nutrients or Orthomolecular Nutrition and the science as Orthmolecular Medicine. Hence, Orthomolecular Nutrition comprises of very complex formulations and are different from standard off the shelf nutritional supplements available at health food stores and pharmacies, which are low dose and prophylactic in nature.

Q5.
What are some of the practical benefits of using Orthomolecular supplements?
Answer:
Orthomolecular supplements have therapeutic benefits on the human body. For example, they can be used to reduce the severity of the symptoms of depression / anxiety, high blood pressure, type 2 diabetes, enlarged prostate, hormone imbalance, thyroid problems, to name a few.

Almost all chronic diseases can benefit from the use of therapeutic doses of nutrition formulated as per the principles of Orthomolecular Medicine.

Q6.
Coming back to the depression and anxiety, what are some of the main nutrients that are found deficient at intracellular levels?
Answer:
Zinc, magnesium and the whole range of B-Complex vitamins are some of the most popular intracellular nutritional deficiencies found in people suffering from depression and anxiety. To be really effective, these need to be administered with a host of other nutrients in the correct proportions to ensure intracellular optimization and extended retention in the human body.

Q7.
Why do nutritional deficiencies occur in the human body?
Answer:
a) Over cultivation of land and the use of synthetic fertilizers has resulted in the depletion of soil nutritional levels. This has resulted in reduced level of nutrition in the food supply to less than 25% of what it was about 50 years back.
b) Weak digestive system which does not efficiently absorb and retain nutrition from the food we eat and the supplements that we take.

An efficient digestive system is the foundation and should be optimized for efficient use of nutrients for the treatment of chronic diseases. To achieve this, a good detoxification of all the excretory organs like the kidneys, colon, lungs, skin, blood and also the liver is very important, along with the rejuvenation of the entire digestive tract. This will ensure proper flow of digestive gastric acids in the stomach, enzymes from the pancreas required for the digestion of proteins, carbohydrates and fats, and adequate flow of bile from the liver to digest the food in the small intestine.

Optimizing the digestive system will ensure that our body receives nutrition not only form the orthomolecular supplements we take but also from the food we eat. Once a treatment is carried out using Orthomolecular Medicine, the body should rely on food alone aided by an optimized digestive system to ensure that the good effects of the therapeutic doses of Orthomolecular Nutrition taken are maintained into the future.

Q8.
How safe are Orthomolecular nutritional supplements?
Answer:
a) They are safe as they are just nutrition, same as is found in a healthy human body. Hence they are biocompatible.
b) Special care is taken not to use extremely high doses of any one nutrient or in isolation which can imbalance the body.
c) The nutrients are at safe dose levels and are in addition synchronized with other nutrients to closely mimic the nutrients found in naturally occurring food. This ensures that they are compatible with the human body and are as close as possible to nutrition found in nature.

Q9.
How long does it take to show some positive results?
Answer:
If your body has begun to manifest serious symptoms like depression or anxiety, high blood pressure, type 2 diabetes, it means that these intracellular deficiencies are large and need your immediate attention. It is estimated that it will take about six months of continuous supplementation to reduce these deficiencies. However, it is very important to also monitor your blood levels periodically, once symptoms reduce, to ensure efficient use of the nutrients being taken.

The human body has a safety mechanism to excrete nutrients not required for its operation. This is the reason why it is very difficult to poison the human body with food taken even in excess of our daily requirements.

Q10.
What are the recent advances in Orthomolecular science?
Answer:
During the last few decades, further research in this science has resulted in a plethora of nutritional supplements which are optimized to safely enhance intracellular nutritional

levels, by carrying nutrition to the center of the cell where it is really required. Ordinary nutritional supplements, available in health food stores adn pharmacies, are designed to only temporarily alter serum nutritional levels and are weak prophylactic doses, which are not capable of therapeutic action on the human body. These prophylactic doses will therefore not be found effective for the purpose of reducing symptoms or severity of depression and / or anxiety and other chronic diseases such as high blood pressure, type 2 diabetes, etc.

Quite often carrier mechanisms are used coupled with cell membrane permeability enhancing mechanisms to help achieve intracellular penetration more efficiently at extremely low dose levels. The need to administer say 30 grams of vitamin C (at mega dose levels) to saturate the blood serum levels, to try and raise intracellular levels is no longer required, due to these recent advances in Orthomolecular Medicine.

Hence, Orthomolecular Nutrition comprises of very complex formulations and are different from standard off the shelf nutritional supplements available at health food stores and pharmacies, which are basically low dose and prophylactic in nature.

Q11.
If I decide to take Orthomolecular supplements, should I discontinue my present prescription medication?
Answer:
You should not discontinue your present medication prescribed by your doctor. Orthomolecular nutritional supplements can be added to the present prescription medication and are best taken that way keeping your safety in mind. As your symptoms reduce in severity your physician who prescribed these medications will be happy to review these prescription doses for you and make necessary changes.

Q12.
What is the basic difference between prescription drugs and orthomolecular nutritional supplements?
Answer:
Prescription drugs are synthetic chemical molecules designed to treat the symptom and give immediate relief. This is the advantage of pharmaceutical preparations. They create immediate order in a chaotic situation. They are also very useful to save lives of people. However, when used on a long term bases, they tend to manifest numerous side effects which may need to be treated with other prescription medication, thereby actually increasing the number of side effects. In order to control the symptoms, these drugs need to be administered daily for the rest of your life. If you stop, the symptoms return.

On the other hand, orthomolecular / intracellular nutritional supplements are designed to treat the root causes of the symptom and do not give immediate relief as they are slow acting in nature. You may need to take them for a few months to a year depending on the severity of the chronic disease you are treating. The advantage is that there are hardly any side effects when administered correctly. Once the symptoms are corrected you should

not need to take them daily for the rest of your life. Since we are treating the root cause of the problem the symptoms normally do not return when these nutritional supplements are stopped. So the cost of the treatment is lower in the long run.

It is highly recommended not to stop your prescriptions drugs when you commence taking orthomolecular supplements. These should be taken in conjunction with each other and are best taken that way in order to ensure your safety. As the severity of your symptoms subside, your physician will be more than happy to review the doses of your prescription medication.

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Appendix IV - Importance of Salt in our Diet – Part 1

New Theory:

Daily intake of salt, required to efficiently operate the human body, is approximately 5.0 grams (1 teaspoon) per day. If, your Serum Electrolytes show marginally low or below normal sodium (Std. Ref. Range = 135 to 145 mmol/L) and chloride (Std. Ref. Range = 98 to108 mmol/L) levels, it is time to wake up, and take immediate corrective action. Sodium and chloride levels tend to go below the normal range if one purposefully and / or fanatically abstained from taking dietary salt or engaged in low sodium diets under the false notion that "salt / sodium is totally harmful for the human body."

If you have landed up deficient in serum sodium and / or chlorides you can make amends by taking ¼ teaspoon of natural salt to lime / lemon juice or just to warm water first thing in the morning on waking up. You can do this once more in the late afternoon / evening if required. Do this for a few weeks at a time and monitor your serum electrolyte levels and bring them to the midpoint of their respective Standard Reference Range. Serum electrolytes should be measured only after discontinuing all sodium supplements (extra intake of salt) for a minimum period of 7 days. This is done to ensure you have determined the true retained value of sodium and chlorides in the body.

* Serum Electrolytes	Standard Reference Range	Optimum Value
Sodium	**136 to 145 mmol/L**	**142 mmol/L**
Potassium	**3.5 to 5.1 mmol/L**	**4.5 mmol/L**
Chlorides	**98 to 107 mmol/L**	**104 mmol/L**

***** Serum electrolytes values can be falsely elevated in case of any kidney insufficiency reflected by serum uric acid, creatinine well above the optimum values. In case of a serious protein deficiency in diet leading to a N2 imbalance (low BUN), the renal profile will be inconclusive.

Table 1 - Optimum Serum Electrolyte Levels

Like sodium, chlorine is also very important for the proper functioning of the human body. There is no richer source of chlorine in our diet than the "chloride" found in sodium chloride. This source of chlorine is what allows our body to generate hydrochloric acid in order to digest food in our stomach. Here hydrochloric acid enables the absorption of iron to prevent anemia; helps to break down proteins for further digestion; and numerous other functions. The low pH of the stomach's hydrochloric acid also destroys ingested bacteria and other microorganisms.

If you have abstained from eating salt for many years, you can be sure that you have poor levels of hydrochloric acid and are "wasting / excreting" the already scarce nutrition available in the food you eat. This causes ill health in addition to the rapid aging of the body. Prescription drugs that cause GI disturbances and / or suppress the flow of gastric acids also contribute to rapid aging the body by depriving the body from receiving nutrition from our daily diet. Conditions such as anemia and poor ferritin levels often result from such deprivation. Healthy stomach acid helps kill disease-causing microbes and parasites routinely found in food you eat.

To determine if the hydrochloric acid produced in your stomach is at an optimum level, a gastrin hormone blood test (Fasting and PP) should be performed. Gastrin (Standard Ref. Range Fasting = ≤ 90 pg/mL) is inversely proportional to hydrochloric acid levels in your stomach. Try to maintain your body to stay at the lower end of the gastrin standard reference range - at approximately ≤ 25 pg/mL (Fasting and Post Prandial).

* Gastrin	Standard Reference Range	Optimum Value
Fasting	**Up to 90 pg/ml**	**≤ 15 pg/ ml**
Post Prandial 2 hours after meal	**Up to 250 pg/ml**	**≤ 25 pg/ml**

*** Gastrin is inversely proportional to HCl levels**

Table 2 - Optimum Gastrin Levels

Again, iodized salt (elemental iodine ≈ 50 mcg/gram) is our primary source of iodine to operate the body. It allows the body to maintain a high rate of metabolism by allowing our thyroid gland to function properly. Improper functioning of the thyroid gland, due to iodine deficiency (less than 150 mcg/day of elemental iodine per person), leads to hypothyroidism, weight gain, increased body fat and poor cardiac health. Abstinence from dietary salt, for numerous years, can cause severe iodine deficiency resulting in goiters, which were rampant in many parts of the world about a hundred years back. We are once again seeing the reemergence of goiters today due to abstinence from salt in our diet.

There is not much merit to the age old theory that salt results in weight gain and high blood pressure. There are many other safer methods to naturally lower high blood pressure without exposing oneself to the damaging effects of dietary salt abstinence. As a matter of fact, the lack of iodine from iodized salt can result in hypothyroidism and weight gain.

For instance, lowering sodium levels in the body to lower hypertension, can also be achieved by increasing potassium intake. After all, it is the ratio of sodium to potassium that is important for the smooth operation of the human body. Increasing potassium intake is easier and has less harmful effects on the human body. The kidneys strive to maintain the sodium / potassium equilibrium in the body at all times. Again, magnesium is very effective in naturally lowering high blood pressure and has very low chances of causing any toxic effects. Excess magnesium is quickly excreted by the body. Again, magnesium is also utilized for building of bones which is a very slow process. Therefore, it normally takes six to twelve months to replenish depleted magnesium levels in the body when therapeutic doses of magnesium are administered.

For more information on use of intracellular magnesium therapy for the treatment of primary hypertension (high blood pressure) please go to:
http://www.space-age.com/HighBloodPressure.pdf

Avoiding salt is therefore, one of the worst and the most damaging methods of high blood pressure control and is definitely not recommended for people pursuing a long healthy life with anti-aging as a goal.

Digestion Begins in our Mouth

Old Theory:

In humans, digestion begins in the oral cavity where food is chewed. Saliva is secreted in large amounts (1-1.5 litres/day) by three pairs of exocrine salivary glands (parotid, submandibular, and sublingual) in the oral cavity, and is mixed with the chewed food by the tongue. There are two types of saliva. One is a thin, watery secretion, and its purpose is to wet the food. The other is a thick, mucous secretion, and it acts as a lubricant and causes food particles to stick together and form a bolus. The saliva serves to clean the oral cavity and moisten the food, and contains digestive enzymes such as salivary amylase, which aids in the chemical breakdown of polysaccharides such as starch into disaccharides such as maltose. It also contains mucin, a glycoprotein which helps soften the food into a bolus.

The gastrointestinal tract starts in the oral cavity (i.e. mouth) where your teeth grind and chew food, breaking it into smaller manageable pieces. This chewing process, known as mastication, is dependent upon powerful muscles (i.e. masseter and temporalis), as well as smaller muscles that permit fine control; they move the mandible (i.e. lower jawbone) against the upper jaw and enable the crushing of relatively hard food. Mastication causes exocrine glands under the tongue and in the back of the mouth to secrete a water-like liquid called saliva which performs two essential functions. It moistens and compacts the chewed food so your tongue can roll it into a ball (i.e. bolus), pushing it to the back of your mouth for swallowing and easy passage through the pharynx and esophagus. In addition, saliva contains digestive enzymes (eg. salivary amylase or ptyalin) which initiate the breakdown of carbohydrates. Mastication and saliva secretion work in harmony: chewing increases the surface area of foods which helps to accelerate the breakdown of starch molecules into simple sugars by the digestive enzymes. Almost no protein or fat digestion occurs in the mouth, except for the release of lingual lipase an enzyme secreted by Ebner's glands on the dorsal surface of the tongue.

In addition to ptyalin, saliva has an enzyme called lysozyme that digests bacterial cell walls, thus killing certain microorganisms. Saliva also has a cleansing action as its constant flow helps to dissolve and remove food particles from the teeth.

The actions of the teeth and tongue prepare food for swallowing. After swallowing, the food enters the esophagus, the next stage of the digestive tract.

Micronization of Food

In order to derive the full nutritional value of food and experience its therapeutic effects, it is necessary to understand the process of micronization.

Normally, grains are made into flour for ease of making dough for breads (e.g. rotis). Here the particle size is quite large, restricting to some extent the bioavailability of nutrition from the food we eat. It also prevents us from experiencing the therapeutic effects food has on the human body.

During micronization, food particles are reduced to micron size and we approach closer to the cell wall to extract the nutrition in a more complete manner. The assimilation and retention of nutrition and other phytochemicals present in food is much higher in the case of micronized food.

This is very important today, as the nutritional value of produce from farmlands has steadily declined to an alarming low level of approximately 25%. This is due to the extensive use of synthetic fertilizers and overcultivation of land during the last 50 years.

Today, farmlands are overcultivated and the soil is almost entirely depleted of nutrition. This has led to a host of chronic ailments such as hypertension, type 2 diabetes, cardiac diseases, and hypothyroidism.

Under these circumstances, it was imperative to innovate the concept of micronization of food; so that the bioavailability of nutrition could be enhanced and optimized to ensure that the human body did not easily develop these kinds of chronic aliments which have become rampant today. These ailments have been wrongly classified as chronic diseases when they are really symptoms of severe nutritional deficiency. These "chronic diseases" or shall I say symptoms, are fully reversible in nature by implementing therapeutic doses of nutrition synergistically administered at the intracellular levels.

"Let thy food be thy medicine and let thy medicine be thy food".

Hippocrates, Circa 400 BC

"The doctor of the future will give no medicine, but will interest his patient in the care of the human frame, in diet and the cause and prevention of disease".

Thomas Edison

Importance of Salt in Digestion – Part 2

New Insight:

The important thing to understand is that the process of mastication causes the production of small particles. This is known as micronization and is untimately responsible for the enhanced release of nutrition from the food we eat.

The mouth essentially serves like a kitchen "wet grinder" and enables the micronization of the food we eat.

It is well established that, when we want to draw out the nutrients from the food we eat, we have to go as close as possible to the cell wall. Chewing one's food thirty-two times before swallowing is therefore emphasized.

Salt or sugar in the diet enables the enhanced release of saliva which allows our "wet grinder" to efficiently micronize the food. While salivary amylase (ptyalin) can break down carbohydrates, the micronized food readily releases proteins and fats for digestion once the food travels past the esophagus. If it was not micronized in our mouth, the nutrition received by our body would be deficient and would contribute to the rapid aging of our body.

It is therefore appropriate to say that 50% of our digestion occurs in the mouth and it is necessary to eat food slowly, without distraction, and not to hastily swallow improperly chewed food. Chewing food thirty-two times with adequate stimulus to enhance the flow of saliva therefore makes sense. Ayurveda talks about the six tastes required in our daily diet and essential to operate the body: sweet, sour, salty, bitter, astringent and pungent.

It is more important to understand the essential role that salt plays in digestion, beginning with our mouth. Salt enhances the flow of saliva and enables our “wet grinder” to function more efficiently to micronize our food for further digestion in the digestive tract.

Salt and sugar are therefore important and essential for the operation of the human body.

Ask most culinary pundits, and they will tell you that salt helps to “draw out the flavor in our food,” Flavor increases the flow of saliva to enhance the digestion of food in our mouth and increases the flow of gastric juices to enhance the digestion of food in our stomach.

It is time to bid goodbye to the widely prevalent theory that salt (sodium) harms our health and must be avoided at all costs by hypertensive and obese patients.

Importance of Hydrochloric Acid in the Stomach

Hydrochloric acid helps digest food by breaking up fats and proteins. The low pH of the stomach’s hydrochloric acid also destroys ingested bacteria and other microorganisms. Adequate levels of HCl are necessary for adequate absorption of protein, calcium, vitamin B12 and iron.

Healthy stomach acid is needed for a healthy digestive tract. If you have low stomach acid, even foods with high level of nutrition cannot be properly digested. If you are unable to absorb nutrients properly, this can lead to chronic health problems. Healthy stomach acid helps kill disease-causing microbes and parasites routinely found in food you eat. If you have low stomach acid, these infecting invaders may not be destroyed in your stomach. They can then lead to many types of infections.

Common Symptoms of Low Hydrochloric Acid

- Bloating or belching, especially after eating
- Burning in the stomach, especially after eating
- Fullness or heaviness in the stomach after eating
- Nausea after eating or taking supplements (especially vitamins and minerals)
- Intestinal gas
- Indigestion
- Bad breath
- Diarrhea or constipation
- Food allergies
- Itching around the rectum
- Weak or cracked fingernails
- Dilated blood vessels in the cheeks or nose (rosecea in nonalcoholics)
- Skin break-outs or acne
- Iron deficiency

- Chronic intestinal parasites
- Undigested food in the stool
- Chronic candida (yeast) infection

Diseases Associated With Low Hydrochloric Acid

- Asthma
- Diabetes
- Osteoporosis
- Arthritis
- Hepatitis
- Eczema
- Acne, rosacea
- Psoriasis
- Gallbladder disease
- Herpes
- Hives
- Hyperthyroid
- Hypothyroid
- Thyrotoxicosis
- Autoimmune disorders
- Lupus erythematosus
- Myasthenia gravis
- Pernicious anemia
- Celiac disease
- Sjogren 's Syndrome

Low Stomach Acid
For many people, as they get older, the parietal cells in the stomach lining produce less and less hydrochloric acid. This is especially true of those who eat: 1) heavily cooked foods (which have no live enzymes), 2) difficult-to-digest foods such as red meat or fried foods, 3) chemicalized foods, such as those containing artificial preservatives and additives, 4) soft drinks, which contain high amounts of phosphorus, white sugar, and immune-stressing chemicals and 5) barbequed foods, which cause high digestive stress. (The blackened areas of the food contain carcinogenic [cancer-causing] agents.)

People Over Age 60
Over 50% of the people over age 50 have low stomach acid. By age 70, 75% have low stomach acid. Healthy stomach acid is crucial to digest food properly in order to maintain good health. Hydrochloric acid is one of your body's first line defenses against disease-causing microbes. Weak stomach acid allows infecting organisms (that would normally be killed by the acid) to get past the stomach and set up infections in other areas. They can cause food poisoning and dysbiosis of the intestinal tract (abnormal overgrowth of unhealthy intestinal microbes).

For people aged 50, over 20% have bacterial overgrowth in the intestines. Over age 70, the percentage increases to 40%. This abnormal bacterial overgrowth is also common in younger people. It is linked to low stomach acid as well as eating a nutrientpoor diet, using antibiotics or pain killers, drinking excess alcohol and other factors. Thus, healthy stomach acid is a critical part of maintaining healthy intestines.

Getting The Minerals and Vitamins In
Adequate hydrochloric acid is necessary to absorb vitamin B12. B12 deficiency can cause muscle weakness, fatigue and many nervous system problems. Healthy stomach acid is also required to

absorb many minerals, including iron, calcium, magnesium, zinc, copper and most B-complex vitamins. Those with poor stomach acid typically have low vitamin C levels.

Exhausted Stomach Acid
Adequate amounts of stomach acid are necessary to break down protein. That's why overeating meat, especially cooked red meat, is hard on the stomach -- it uses up the stomach's acid and enzymes
very quickly. Eating red meat day after day can exhaust the stomach's ability to build up sufficient amounts of hydrochloric acid. Your best bet is to limit or eliminate red meat in your diet. Instead, enjoy an excellent, high quality vegetarian protein sources – mushrooms, beans, lentils and pulses.

Red meats are difficult to digest and contains arachidonic acid which encourages inflammatory by-products which can lead to joint pain, fatigue and osteoporosis.

Acid Stomach
Low stomach acid can cause indigestion. Believe or not, too little stomach acid is the most common cause of an acid stomach, not excess acid. Some people take antacids to relieve the uncomfortable acid feeling in their stomachs (common after eating high protein or high fat meals). But the vast majority of those with an "acid stomach" suffer from not enough acid. They simply can't digest what they've eaten. For some, an antacid may temporarily relieve a queasy stomach, but in the long run, regular use of antacids makes the problem worse.

Naturally Increasing Stomach Acid
Be sure you have adequate daily salt intake (from natural sea salt). The chloride fraction in salt is essential for your body to make hydrochloric acid. That's why a low-salt diet commonly leads to poor digestion over time.

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Notes – Observations from Clinical Studies:
The daily requirement of salt is about 5.0 gram for an adult weighing about 150 lbs. (70.0Kg). Again, this requirement will change depending upon the room temperature, body sweat, humidity, summer, winter, how much water you drink daily, etc. So one person may be OK with 3.0 grams per day and someone may require 5.0 grams per day because they exercise a lot and also sweat a lot.

The body knows how to excrete excess salt when taken within limits. So you do not really need to weigh the actual salt daily and take it like a tablet or a capsule. Just adding salt to enhance the taste of the food is enough control. You really do not need to fanatically avoid salt in peanuts or pistachios or cashews or potato chips or French fries or butter. Adding salt to drinking water on a hot summer day when you are sweating is also OK.

Also, I would avoid eating canned food full of sodium preservatives. This is normally sodium citrate and does not provide chlorides (chlorine) to produce hydrochloric acid. I would eat only fresh food.

What has happened in the last two decades, and we are seeing this in the patients that come to us, is that patients have stopped eating salt or salty food for a number of years (because they believe it is bad for health). Subsequently, their blood reports show extremely low sodium and chlorides and consequently high gastrin levels (at the upper end of the Standard Reference Range) indicating poor hydrochloric acid supply. Some times the sodium and chloride levels are dangerously well below the lower end of the Standard Reference Range.

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Appendix V – Vitamin D and its Importance in Cardiology.

Under Graduate Level Studies in Nutrition

An Introduction:
High dose vitamin D taken over a prolonged period is highly toxic to the human body. Once you exceed the normal limits it is difficult to remove this excess from the human body.

Excessive vitamin D causes calcium to deposit in various organs / tissues of the body and can also lead to to the formation of kidney stones, calcification of arteries / heart valves, heel spurs, osteophytes, etc.

Prolonged use of vitamin D can result in toxicity, body aches and pains, and can mimic the symptoms of osteoporosis.

Try to maintain your Vitamin D3 levels around 40 ng/mL. Above 80 ng/mL may be toxic. Ref: Harrison's Principals of Internal Medicine, 12th Edition, Pages 1892 to 1901.

Reproduced below is an extract taken from a textbook of undergraduate nutrition: (with my parenthetical commentary in italics where I found the need to amplify and clarify)

Murray, Michael T. Encyclopedia of Nutritional Supplements. Roseville: Prima Publishing, 1996. ISBN 0-7615-0410-9

Pages 42 and 43.

"Principal Uses of Vitamin D
The principal use of vitamin D is the prevention of vitamin D deficiency."

(It is important to note that the author doesn't say that vitamin D is used for the treatment of osteoporosis, cancer or any other disease)

"**Dosage Ranges**
The RDA for vitamin D is 200 to 400 I.U. daily. For elderly people not exposed to sunlight for living in the northern latitudes, a daily intake of 400 to 800 I.U. is recommended. Supplementation greater than 400 I.U. per day in most adults, young children, and adolescents, is unwarranted."

(The author refers to doses higher than 400 IUs for most adults as "unwarranted". He discloses below that vitamin D is highly toxic to the human body)

"**Safety Issues**
Vitamin D has the greatest potential among all the vitamins to cause toxicity. Dosages greater than 1,000 I.U. per day are certainly not recommended. Increased blood concentration of calcium (a potentially serious situation), deposition of calcium into internal organs, and kidney stones are some of the characteristics of vitamin D toxicity."

(Note the words "greatest potential" to cause toxicity. This means highly toxic. It has been known for decades, and even a part of standard undergraduate textbooks on nutrition, that vitamin D toxicity causes kidney stones. So the "findings" of USPSTF are not new. The author goes on later to say it also causes calcification of arteries, heart valves, etc. Again, these are not new findings).

"Many researchers suggest that long-term over consumption of vitamin D in fortified foods contributes to atherosclerosis and heart disease, possibly as a result of decreasing magnesium absorption." [2]

(Note the author stresses on the risk of excessive vitamin D reducing absorption of magnesium. The author indirectly indicates that magnesium is very important and not to do anything to reduce its levels in the body).

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2. Seelig MS, Magnesium deficiency with phosphate and vitamin D excess: Role in pediatric cardiovascular nutrition. Cardio Med *3(1978), 637-650*"

Notes:

It is important that the knowledge (available in standard textbooks) be brought to the attention of health practitioners and cardiologists in particular so that a safe and healthy lifestyle can be maintained.

Since vitamin D is known as a highly toxic substance, (note the words "greatest potential to cause toxicity"), there is no sense in doing research at many higher IUs of vitamin D in a bid to find out a "magical dose" at which there will be some benefit to the human body. The basic tenet of medicine is that the "doctor will do no harm to the patient's body".

The United State Preventive Services Task Force has recently "found out" that less than 400 IUs of Vitamin D and less than 1000 mg of calcium is detrimental to the human body and causes kidney stones in a significant number of healthy adults. This is in agreement with the undergraduate textbooks on nutrition from which the above extracts are taken. The National Institute of Health has withdrawn its support to 1200 mg of calcium for prevention of osteoporosis in healthy adults many years back.

The importance of vitamin D in cardiology cannot be ignored. Vitamin D toxicity causes the deposition of calcium in various parts of the body and can result in calcification of

arteries and heart valves for example. This is what makes the in depth understanding of vitamin D in cardiology so very important.
The recent re-findings in many research papers on calcium toxicity in cardiology is also to be found in my commentary above of undergraduate nutritional textbook. This has been known to undergraduates in nutrition since decades. Also vitamin D toxicity which is further compounds calcium toxicity is important in cardiology for similar reasons. We are today living in a calcium toxic society and all around us we see undiagnosed cases of calcium toxicity in the form of calcified arteries, heart valves, osteophytes, heel spurs, kidney stones, etc.

There also exists a possible risk of fortified foods causing calcium and / or vitamin D toxicity in the human body.

A daily consumption of calcium and vitamin D fortified yogurt twice a day, drinking fortified milk three times a day, eating 3.0 oz. (120 grams) of cheese and eating fortified bread twice a day, for prolonged periods, (long after having reached adulthood when the body stops growing), can result in exceeding the safe limits of the Recommended Daily Allowance (RDA) and end up slowly but surely poisoning the body and can result in calcified arteries, heart valves, kidney stones, heel spurs, osteophytes, etc. later on in life.

Basically, my advice to patients suffering from cardiac diseases is to avoid dairy products as they are a rich source of calcium. This also means stop taking calcium supplements. This change in diet and life style alone can provide a lot of relief to the symptoms of cardiac diseases.

A more active approach to improve cardiac health will be to use magnesium supplements as discussed in Appendix I and II (pages 29 and 34).

You have an option to continue studying vitamin D further and go on to a Post Graduate Course in vitamin D

Or

Please return to page 4 to continue with the reading of the Paper on Reversal of Hypertension – Primary and Secondary.

To proceed further to a deeper study of vitamin D ..…….

Post Graduate Studies in Vitamin D

Reproduced below is an extract taken from:
(with my parenthetical commentary in italics where the need is found to amplify and clarify)

James M. Orten, Otto W. Neuhaus **Human Biochemistry**, The C. V. Mosby Company – Tenth Edition, 1982. ISBN 0-8016-3730-9

James M. Orten, Ph.D.
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Wayne State University School of Medicine,
Detroit, Michigan; Fellow, American Institute of Nutrition

Otto W. Neuhaus, Ph.D.
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Relation of radiant energy

"Interesting recent observations suggest that the rate of synthesis of cholecalciferol from 7-dehydrocholesteril in the skin (stratum granulosum) is regulated by the amount of pigmentation and keratinization in the overlying stratum corneum. This regulates the amount of solar ultraviolet radiation, especially at 290 to 320 nm, that penetrates into the stratum granulosum and forms vitamin D. Thus white skin, which contains little pigment and keratin, allows maximal ultraviolet penetration. Yellow skin, which contains more keratin, permits less ultraviolet penetration, whereas black skin, which is more pigmented, permits still less. These differences are apparently a genetic adaptation to climate. Hair or fur in animals is a still further regulatory mechanism. Vitamin D synthesis is thus maintained within physiological limits estimated to be 0.01 to 2.5 mg of cholecalciferol per day. Skin pigmentation also may correct for seasonal variations, e.g., tanning in the summer months in northern latitudes."

(Note: What is noteworthy here is that skin pigmentation, being different in various geographical regions, plays an important role. It is also one of the mechanism in the human body that ensures that excessive exposure to sunlight does not in any way cause vitamin D toxicity. With more exposure to sunlight the skin also begins to tan to a darker shade, thereby regulating the production of vitamin D. Besides this, other feedback loops exist in the body that when coupled with the body's ability to store excess vitamin D for later use, ensures that sunshine does not create any toxicity in the human body).

Occurrence

"Cod liver oil and other fish liver oils are the best natural sources of vitamin D. The edible portions of oily fish, e.g., sardines, salmon, herring, are also excellent sources. Egg yolk and liver of the commonly slaughtered animals contain amounts that depend on the food of the animal from which they are derived, but mammalian liver is not very rich in this vitamin D. Milk contains little vitamin D unless enriched in one of several ways, and vitamin D milk is now a common article or the American dietary. Many ordinary foods, among them the green plants, contain small quantities, and mushrooms contain slightly greater amounts. In general, this vitamin is not widely distributed, but the fact that it can be provided in three ways should make its deficiency rather uncommon, These three ways of providing vitamin D are (1) by furnishing the vitamin as it occurs naturally in foods or by enriching the food by the additions of vitamin D, (2) by irradiating foods containing precursors of the vitamin, and (3) by irradiating the skin of the individual with ultraviolet light or sunshine."

(Note: Different types of eggs will have varying amounts of vitamin D based on the conditions under which the eggs were produced and the way the poultry were fed and bred. For example, hens that were not allowed to roam around and were cooped up in little cages will not have the same amount of vitamin D as their counter parts who were free range and pasture fed hens. Three ways to increase vitamin D include: 1) consuming enriched foods; 2) consuming irradiated foods; and 3) irradiating the skin with ultraviolet rays or by direct exposure to sunshine. A possible fourth way would be by topical applications of creams or gels enriched with therapeutic doses of vitamin D).

Absorption

"Absorption of vitamin D from the intestinal tract requires the presence of bile salts. Here again mineral oil acts as a hindrance because the vitamin is soluble in it and consequently is carried through the intestine into the feces. After absorption, cholecalciferol is apparently transported in the plasma, tightly bound to an α_2-globulin."

(Note: If you have a liver with a poor liver function test (LFT) and borderline liver enzymes, it is most probable that the flow of bile will be less efficient. In addition, if you had your gall bladder removed, suffer from gallstones, or have a partial blockage of gall bladder duct, you will have a poor supply of bile. For efficient absorption of vitamin D, the enzymes (AST, ALT and Gamma GT) in the LFT Test must ideally be maintained in the 15 to 20 U/L range.

Liver insufficiency in terms of poor bile flow into the intestines will itself result in poor levels of serum vitamin D.

There are two other situations which need to be highlighted here that cause vitamin D malabsorption. One is the use of drugs like orlistat which block the

digestion and the absorption of fats in the digestive tract and the other is the poor flow of enzymes especially lipase, from the pancreas. Lipase helps in digestion of fats. In both these situations the absorption of vitamin D is compromised.

The correlation of magnesium and vitamin D is the case of which came first - the chicken or the egg,. Excessive vitamin D causes depletion of magnesium and low magnesium levels in turn cause malabsorption of vitamin D.1 So monitoring serum and RBC or erythrocyte magnesium levels from time to time while on vitamin D supplementation is highly recommended.

To counteract all the above mentioned situations you will end up taking abnormally large doses of vitamin D to achieve appropriate serum vitamin D levels. It would however be far safer to achieve normal serum vitamin D levels through natural rather than artificial means).

(Serum values of vitamin D are no indication of the total amount of vitamin D stored in the body. When vitamin D levels go very low (say below 10 ng/mL) it is a good indication that the total vitamin D stores in the body has also been depleted. When mega doses of vitamin D (typically 50,000 IUs once a week for six to eight weeks) are administered for a short while to quickly correct this deficiency and the serum levels just start showing sufficiency, it does not mean that the depleted body fat levels of vitamin D have been replenished. It may take additional months of much lower therapeutic doses of vitamin D to correct the deficiency of vitamin D stores. Do not confuse serum levels with total amount of vitamin D stored in the body. Again measuring serum levels of vitamin D are best attempted 7 days after discontinuing the intake of vitamin D. This allows the body to normalize vitamin D serum levels and show more realistic values.

Sunshine is capable of producing large amounts of vitamin D in one hour of skin exposure. (Individuals exposed to excessive sunlight may have concentrations of 25(OH)D up to 370 nmol/L / 150 ng/mL without adverse effects on calcium metabolism)2. However, don't be disappointed if after a month or two of regular exposure to sun your serum levels do not show very high levels. The reason for this could be that the vitamin D being produced is being utilized for replenishing depleted vitamin D stores in the body. This is especially true if your vitamin D levels were 10 ng/mL or lower to begin with).

Effects of deficiency

"Another clinical condition indirectly associated with a lack of cholecalciferol is celiac disease, also know as idiopathic steatorrhea, gluten-sensitive enteropathy, and nontropical sprue, discussed later in this chapter. Here, as in osteomalacia, there is an impaired mineralization of the bones, which may result in deformities of dwarfism. Here, too, a low serum calcium and low serum phosphorus are found, with possible manifestations of tetany. Celiac disease is indirectly a vitamin D deficiency because the primary abnormality seems to be, in part, a

fatty diarrhea. The fatty acids in the intestinal lumen are not absorbed normally and carry with them into the stools calcium soaps and vitamin D."

(Note: Celiac disease results in poor absorption of vitamin D from the intestines. So again, abnormally large doses of vitamin D may have to be orally administered to achieve satisfactory serum levels. A better option would be go for topical application of vitamin D through a transdermal delivery system or go for ultraviolet irradiation of the skin).

"In all the conditions mentioned the administration of vitamin D in therapeutic doses, or ultraviolet irradiation, or both, produce good result."

(Transdermal method is the preferred method as it does not increase the load on the excretory organs. I will try to further explain the route to transdermal delivery. Approximately 80% of all nutrition taken orally is excreted from the body. This creates a load on the excretory organs. The effective part retained in the body is approximately only 20%. So when we want to convert oral doses to transdermal ones, we need to only use 20% dose for topical application. If we were to assume a RDA for oral administered vitamin D to be 400 IUs, it means that you only need to apply approximately 80 IUs topically to the body. So if presently your Vitamin D daily dose is 4000 IUs then it would translate to 800 IUs topically or most probably much lower, since you may be have started off with malabsorption issues to begin with. This is a strong possibility in view of having to take such large doses [4,000 to 8,000 IUs] orally.

So the question arises how do we go the transdermal route?).

(1 teaspoon of cod liver oil can have approximately 400 to 1,000 IUs of Vitamin D. Apply one teaspoon of cod liver oil topically at late evening or before going to bed but after a bath. If you don't like the smell of cod liver oil, add a drop or two of aromatherapy oils like lavender, geranium, jasmine, etc. Apply to your legs, thighs or arms. Rotate the area of application each day. Oil typically gets absorbed within 15 to 20 minutes and does not get messy. Leave on overnight and you will be able to get past any malabsorption problem and put in enough vitamin D to get your levels above 30 ng/mL or 40 ng/mL, what ever you choose, so long as this level does not cause your magnesium levels to go below an optimum level of 2.4 mg/dL / 1.0 mmol/L (serum) and 6.0 mg/dL / 2.5 mmol/L for RBC or erythrocyte (intracellular) magnesium. At these levels of magnesium, the risk of osteoporotic fractures is minimized mainly due to increased bone flexibility. Remember bone flexibility is more important than bone density.

The second route to get therapeutic transdermal vitamin D is to use a specially formulated vitamin D gel containing 4,000 IUs of Vitamin D per gram of gel. Applying a pea size quantity (0.25 g) will result in 1,000 IUs topically into the body. This is equivalent to an oral dose of 5,000 IUs. The beauty of a transdermal dose of vitamin D is that it does not cause any spikes of serum

vitamin D levels through out the day and is gradually delivered into the blood stream over a 24 hours period. One application after a bath in the morning will help to maintain your vitamin D levels in a very steady manner and allow its proper storage in the body fat for use months later when sunshine is inadequate, as in winter).

Mechanism of action

"Vitamin D has a regulatory influence on calcium and phosphorus metabolism. Both calcium and phosphorus must be present in the diet to have the complex calcium salt deposited in bone. However, no matter how great an amount of these minerals is available, normal calcification does not take place in the absence of this vitamin. On the other hand, even if the supply of calcium and phosphorus is practically at starvation levels, an optimum amount of cholecalciferol can enable them to be utilized and deposited in a nearly normal manner."

"In the first place, vitamin D causes an increased absorption of calcium and phosphorus from the intestinal tract. In studies on the transfer of 45Ca across the membrane of everted segments of small intestine of rats, vitamin D greatly increased the rate of passage of 45 Ca across the intestinal mucosa. There was an active transport (i.e., against a concentration gradient) in the proximal portion of the small intestine that was dependent on the energy of oxidative metabolism. Vitamin D also increased the rate of facilitated transfer of calcium along the entire length of the small intestine. Using the same technique, investigators have found that ergocalciferol likewise increases the absorption of phosphate."

(Note: *High levels of Vitamin D and excessive intake of vitamin D over a prolonged period is known to cause depletion of magnesium levels in the body.1 Magnesium is very important for the treatment of numerous chronic diseases such as osteoporosis, high blood pressure and type 2 diabetes. Again, adequate levels of magnesium are required in the body to aid proper absorption of vitamin D. So it is a never-ending downward spiral in which the body can go into, if proper evaluation of RBC / Erythrocyte and serum magnesium levels are not done periodically, when taking vitamin D supplementation. Again, if you are on magnesium supplementation, discontinue magnesium for 7 days before drawing a blood sample to ensure that the serum levels have returned to normal and show the true retained values.*

Human requirements

"The vitamin D requirements of normal infants and children are especially important and depend partly on the amount of ultraviolet light to which they are exposed. Remember that the effective ultraviolet rays do not penetrate ordinary glass. Therefore exposure to sunshine coming through window glass is of little value. Smoke also impedes the penetration of these rays, and consequently city sunshine is not always beneficial. For this and other reasons some vitamin D

should be included in the food of younger individuals. The Food and Nutrition Board (1980; Table 21-4) recommends 10 ug / 400 IUs of cholecalciferol daily for infants, children, and young adults up to the age of 19 years. The same amount is advised for women during pregnancy and lactation. The 1980 RDA for both males and females, ages 19 to 22 years, is 7.5 ug cholecalciferol per day (table 21-4). Therefore the RDA is 5 ug cholecalcigerol per day for both sexes, The minimal requirement for vitamin D is difficult to determine because of the variability of environmental factors such as sunshine. However, the RDA provides an adequate margin of safety over a minimal value. Ten ug of pure crystalline vitamin D_3 is equivalent to the biological activity of 400 IU formerly used."

(Note: The author supports a RDA not, exceeding 10 μg / 400 IUs of vitamin D for most adults when administered orally. Recent studies have shown that 600 IUs to 800 IIUs could be used for a period of one year to safely remove a state of deficiency). 3

Toxic effects

"After administration of an excess of vitamin D to a mammal the vitamin can be found in the circulating blood for months. Thus the use of enormous doses of vitamin D is not without danger. Severe and even fatal effects have been noted. The toxic manifestations caused by excess dosage include nausea, anorexia, weakness, headache, digestive disturbances, and polyuria. Irreversible damage to the kidneys, as well as calcification of other soft tissues, results. The threshold of toxicity seems to be about 500 to 600 ug cholecalciferol per kilogram of the body weight per day. Such doses are not ordinarily employed."

"The reason for the toxicity of vitamin D is the difficulty of excretion of this vitamin rather than its storage in the liver. Any excretion is gradual, by way of the bile. Excess cholecalciferol injected into animal remains in the circulation for several months. In contrast, the water-soluble vitamins, if given in excess, are excreted promptly in the urine and are therefore relatively nontoxic."

(*Note: What we need to understand here is that serum vitamin D tests are incapable of measuring vitamin D stores in the human body. They only measure the vitamin D in circulation in the blood. Since vitamin D is stored in the liver and also in the fat of the body, it means that if you were to indeed have sufficient exposure to sunlight in spring, summer and fall, you could technically have some reserves left over for winter when sunshine may be scarce in some parts of the world.)*

(Since there is no further evolution of the human body during the last 100 years, the standards of vitamin D toxicology have not changed during this period. The serum ranges and doses given in standard medical textbooks like Harrison's Principles of Internal Medicine therefore need to be adhered to. 2 Here they have defined the upper safe serum upper limit of 80 ng/dL.

Again supplements as the word indicates are to be used to supplement natural sources of vitamin D like adequate sunshine and diet and should not to be used as drugs for life. This will ensure minimum risk of overdose and accidental toxicity.)

References:

1. Seelig MS, Magnesium deficiency with phosphate and vitamin D excess: Role in pediatric cardiovascular nutrition. Cardio Med *3(1978), 637-650*"

2. Harrison's Principles of Internal Medicine 12th Edition. 1991.

3. Gallagher JC, Sai A, Templin T 2nd, Smith L., Dose response to vitamin D supplementation in postmenopausal women: a randomized trial. Ann Intern Med. 2012 Mar 20;156(6):425-37. Erratum: Ann Intern Med. 2012 May 1;156(9):672. PMID: 22431675

Some Useful Links for a More Detailed Study:

Dietary Intake Reference for Calcium and Vitamin D
Institute of Medicine (IOM) Nov 2010 / Revised March 2011
http://www.space-age.com/VitaminDandCalcium2010ReportBrief.pdf
Analysis of IOM Report Updated as per findings of USPSTF June 2012
http://www.space-age.com/IOM-Findings.pdf

Vitamin D and Calcium Supplementation to Prevent Cancer and Osteoporotic Fractures - June 12, 2012
USPSTF - Fact Sheet on Vitamin D and Calcium
http://www.space-age.com/vitdfact.pdf

United States Preventive Services Task Force - Vitamin D & Calcium Supplementation to Prevent Cancer and Osteoporotic Fractures [pdf file] or [doc file]
Answers to Questions on USPSTF Comment Form
http://www.space-age.com/USPSTF.pdf

Appendix - VI

Sample Protocol for Secondary Hypertension

Phase - I

A. For Improved Gastric Digestion

Digestive Aid B4 - (BkF + L + D) X 2 Months
(Take half to one hour before meals)
Helps to increase the flow of gastric acids.

Increase intake of digestive herbs like cumin (jeera), coriander seeds (dhania seeds), ginger (adrak), Bishop's Weed (ajwain), fennel seeds (saunf or badishep) and asafetida (hing) in daily diet.

B. For Improved Digestion of Protein

Pancreatin 500mg - after (BkF or L + D) X 1 Month
(Take immediately after Breakfast or Lunch and Dinner)
These digestive enzymes will improve the digestion of proteins, fats and carbohydrates)

C. For Kidney Detoxification / To lower Creatinine and Cystatin C

Super Kidney Care - (M + E or B) X 2 Months
(A reddish or pink color may be imparted to urine when taking these herbs)

Kidney Bladder Flush - (M + E or B) X 2 Months
(A reddish or pink color may be imparted to urine when taking these herbs)

1 cup GOPU Tea - (M + A or E) X 3 Months
Mild herbal diuretic, very effective, which will help repair and rejuvenate the kidneys. Do not take at night.
Herbal diuretics do not cause loss of potassium like drug diuretics - Lasix (furosemide), HCTZ (hydrochlorothiazide. If you experience leg cramps, it is because of dehydration caused by increased urine flow. By drinking an extra glass or two of water leg cramps will go away.
(Begin with half teaspoon of powder and gradually increase to 1 to 2 teaspoons to get used to the taste).

Drink lots of water throughout the day.
Color of urine should be very light and not dark.

Kidney Detoxification & Rejuvenation for Renal Induced Hypertension

Please monitor your blood pressure each morning on a daily basis half to one hour after waking up and before exercise / gym work and / or shower. Follow procedure mentioned in Art of Measuring Blood Pressure on page 17 of this file. It is important to rest for minimum of 10 minutes in sitting position before measuring your blood pressure. Drink a glass or two of water 30 minutes before to ensure that you are not dehydrated, which can cause a false reading of blood pressure and heart rate. Please do not talk, laugh,

cough, sneeze or unnecessarily move your muscles. Every change in sitting posture during the 10 minutes resting period will alter your blood pressure.

If your blood pressure has reduced substantially, it is time to ask your health care provider to review your blood pressure / cardiac medication. Once there is some reduction in blood pressure it is best to titrated doses of prescription drugs taken for hypertension downwards in order to maintain blood pressure around 140/90.

Pl keep a log of your blood pressure and heart rate reading at say 7:30 am before exercise / gym work / shower on daily basis, in a spreadsheet or doc file. Repeat readings at same time each day. E-mail this back to us on a weekly basis.

VERY IMPORTANT:
Do not allow your blood pressure to go below 120/80 and heart rate below 70 bpm. Hypotension and/or low heart rate (bradycardia) can cause loss of balance, feeling of passing out and can cause a fall.

D. For Acidity / Acid Reflux

1 to 2 GastriX - (M + E or B) X 2 Months
(Take total 2 to 4 capsules per day)

Special Notes for Persons with symptoms of Acidity

1) Avoid Alcohol – beer, wine, champagne, etc.

2) Avoid Green Chilies and Cooked Tomatoes in your diet.

3) Drink half cup of whole milk (full fat) with micronized Saffron once or twice a day only when symptoms of acidity (like acid reflux, colds, allergies throat pain and breathlessness) are acute.

Note:

Acidity is due to erosion of the mucus membrane lining of the digestive tract.

Diary products enhance the secretion of mucus and help quickly build up the mucus membrane lining to help reduce the symptoms of acidity.

Antibiotics, Asprin and Paracetamol (Acetaminophen) all erode the mucus membrane lining and increase the symptoms of acidity and should be avoided at all costs.

Notes:
Drink 3.0 liters / 96 oz (250mL / 8.0 oz x 12 glasses) of water per day at the rate of 1 glass (250mL / 8.0 oz) per hour only. Do not drink 1.0 liter / 32 oz (4 glasses) of water at a time.

Please implement Abdominal Vacuum Exercise as per attached note. (Page)
Do early in the morning on waking up (on an empty stomach i.e. before breakfast, glass of water is fine.
Helps to improve urine flow, force of urination and reduce Post Void Residue / urine retention in bladder after passing urine)

Some known Side Effects of Losartan
a) Swelling on face
b) Feeling of passing out

Abbreviations:

A = Afternoon
B = Bedtime
B4 = Before
BkF = Breakfast
D = Dinner
E = Evening
L = Lunch
M = Morning
2 = 2 capsules at a time
(for example: 2 Magnesium Pro (Forte) - (L + D) means take 2 capsules of Magnesium Pro (Forte) at Lunch and also at Dinner.

NOTE:

Above Program will be reviewed from time to time as per the evaluation of the progress achieved and results obtained.

At the end of each month, please contact with your detailed feedback so that the modification as required can be made to the program.

Phase - II (Date of implementation to be decided)

E. For Hypertension & Improved Cardiac Efficiency.

2 Organic Magnesium (Forte) 180mg - (M + B) X 3 Months
(W/B6 -20)

2 Organic Magnesium (Forte) 180mg - (L + D) X 3 Months
(W/O B6)

OR

2 Magnesium Pro (Forte) 90mg - (L + D) X 6 Months
(W/O B6)

VERY IMPORTANT
Please keep 3 to 4 hours gap between each of the above doses of Magnesium. Please take 2 capsules of each type of Magnesium at a time. Total number of capsules to be taken is 8 per day.

Avoid dairy products like Milk, Cheese (Paneer), Yogurt (Curds), Butter milk (Lassi, Chaas), Dhai etc. as they are rich in Calcium which interferes with absorption of Magnesium.

For Renal Induced Hypertension

Please monitor your blood pressure each morning on a daily basis half to one hour after waking up and before exercise / gym work and / or shower. Follow procedure mentioned in Art of Measuring Blood Pressure on page 17 of this file. It is important to rest for minimum of 10 minutes in sitting position before measuring your blood pressure. Drink a glass or two of water 30 minutes before to ensure that you are not dehydrated, which can cause a false reading of blood pressure and heart rate. Please do not talk, laugh, cough, sneeze or unnecessarily move your muscles. Every change in sitting posture during the 10 minutes resting period will alter your blood pressure.

If your blood pressure has reduced substantially, it is time to ask your health care provider to review your blood pressure / cardiac medication. Once there is some reduction in blood pressure it is best to titrated doses of prescription drugs taken for hypertension downwards in order to maintain blood pressure around 140/90.

Pl keep a log of your blood pressure and heart rate reading at say 7:30 am before exercise / gym work / shower on daily basis, in a spreadsheet or doc file. Repeat readings at same time each day. E-mail this back to us on a weekly basis.

VERY IMPORTANT:
Do not allow your blood pressure to go below 120/80 and heart rate below 70 bpm. Hypotension and/or low heart rate (bradycardia) can cause loss of balance, feeling of passing out and can cause a fall.

Abbreviations:

A = Afternoon
B = Bedtime
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D = Dinner
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M = Morning
2 = 2 capsules at a time
(for example: 2 Magnesium Pro (Forte) - (L + D) means take 2 capsules of Magnesium Pro (Forte) at Lunch and also at Dinner.

NOTE:

Above Program will be reviewed from time to time as per the evaluation of the progress achieved and results obtained.

At the end of each month, please contact with your detailed feedback so that the modification as required can be made to the program.

Phase - III (Date of implementation to be decided)

F. Detoxification & Rejuvenation Kit - 8 week program (M60Plus)

Follow Calendar enclosed with Kit. Additional copy of Calendar is attached here.

Drink 3.0 liters / 96 oz (250mL / 8.0 oz x 12 glasses) of water per day at the rate of 1 glass (250mL / 8.0 oz) per hour only. Do not drink 1.0 liter / 32 oz (4 glasses) of water at a time.

Please implement Abdominal Vacuum Exercise as per attached note.

Do early in the morning on waking up (on an empty stomach i.e. before breakfast, glass of water is fine.

Helps to improve urine flow, force of urination and reduce Post Void Residue / urine retention in bladder after passing urine)

Following additional supplements to be simultaneously taken (in addition to supplements in above Kit / Calendar) as per protocol given below:

Note:
Begin with one or two items from list below and gradually add one more supplement every few days.

G. For General Nutritional Support

Mineral Boost - (BkF or L + D) X 3 Months
(Batch III)
(Do not take on empty stomach)

Great way to reduce Body Fat / Weight:
Staircase climbing for 30 minutes per day will result in 1.0 Kg Fat loss every 10 days. Begin with 5 minutes and increase time gradually to avoid discomfort.

Note: Walk 30 to 60 minutes early morning or evening. Alternately, climb stair case 5 to 30 minutes (increase gradually to reach 30 minutes / day) to help reduce Body Fat and weight.

Abbreviations:

A = Afternoon
B = Bedtime
B4 = Before
BkF = Breakfast
D = Dinner
E = Evening
L = Lunch
M = Morning
2 = 2 capsules at a time
(for example: 2 Magnesium Pro (Forte) - (L + D) means take 2 capsules of Magnesium Pro (Forte) at Lunch and also at Dinner.

NOTE:

Above Program will be reviewed from time to time as per the evaluation of the progress achieved and results obtained.

At the end of each month, please contact with your detailed feedback so that the modification as required can be made to the program.

Adjusting Anti-Hypertensive Prescription Drugs

Case Study - Secondary Hypertension

Patient on:
Losartan 100 mg (1 - 0 - 0)
and
Amlopdipine 2.5 mg (0 - 0 -1)

Part A

Thank you for the updated BP readings.

While going through these readings, I see quite a few low ones especially on 14th, 15th and 16th of February.

This is a very good sign that our procedure of deep kidney detoxification is beginning to show some positive results.

I am greatly concerned about your reading of Feb 20th where the systolic has gone below 100.

This is a sign of great concern that the prescription medication you are presently taking is perhaps far in excess of your body's requirements and that a review is now warranted.

Please keep a close watch and make sure that you do not go Hypotension.

I am reproducing below a cautionary note from your protocol of February 08th:

" If your blood pressure has reduced substantially, it is time to ask your health care provider to review your blood pressure / cardiac medication. Once there is some reduction in blood pressure it is best to titrated doses of prescription drugs taken for hypertension downwards in order to maintain blood pressure around 140/90.

VERY IMPORTANT:
Do not allow your blood pressure to go below 120/80 and heart rate below 70 bpm. Hypotension and/or low heart rate (bradycardia) can cause loss of balance, feeling of passing out and can cause a fall."

Since your morning blood pressure is now consistently below systolic 120, I suggest you first review your evening dose of Amlodipine 2.5 mg. Normally blood pressures are low while sleeping. So consider titrating this dose down as a first step to boost your early morning systolic blood pressure.

Should this not show any improvement over the next 7 days period after titration, you can then consider reducing Losartan from 100 mg to a slightly lower dose and closely watch your BP reading over the next 7 days to see the average value.

Please discuss your blood pressure reading and this strategy with your health care provider before you implement it.

But in any case your early morning blood pressure should not be consistently allowed to stay below 120/80 while on this program.

We normally recommend that you target early morning BP at below 140/90 when considering titrating Amlodipine and Losartan downwards.

With each passing week we should continue to see some more improvements in your blood pressure and heart rate reading.

Part B

As we go ahead with the program for Reversal of High Blood Pressure we need to make sure that do not put the patient in harm's way. It is the natural outcome of our program that the drugs presently taken will be more than required to keep blood pressure in check. As a matter of fact, it is also a normal outcome of our program that the doses of the prescription drugs taken will cause his blood pressure to go below safety norms mentioned in our program.

It is important that the timing of the drugs not be disturbed, since we have patiently collected data during the last few weeks based on these exact doses and timings. In order not to create a chaotic situation we can only titrate one of the two drugs that were introduced last into his body in a systematic way and the blood pressure monitored for the next 7 days before we touch the other drug. Also, we must make a judgment as to which is a safer one to titrate first. Keeping all this in mind, I had suggested that we try titrating Amlodipine first and monitor the outcome over the next seven days. The evening dose of Amlodipne was chosen because the supine blood pressure is always the lower one, especially at night, while one is sleeping, and it will help to increase the early morning blood pressure measured at 7:30 am before the dose of Losartan 100 mg is being taken at 8:00 am.

Only one change can be done at a time while our dietary supplemental program is implemented as per doses given in our Program. This is to ensure that we do not put the patient in harm's way. Hypotension is a serious possibility, and should not be over looked as an outcome of not having made appropriate changes in the prescription drug doses in a timely manner.

Again, when the control of the patient's blood pressure has been handed over to drugs for so many years, we have to give the body an opportunity and adequate time to relearn the process of controlling blood pressure and normalizing heart rate. This relearning of the body can only occur when the drug doses are gradually and safely reduced over a period of time. The best way to do this is to target blood pressure just below 140/90. This is why I have recommended this in my note.

Monitoring Kidney Function

Here is a further clarification about the kidney rejuvenation program especially for high blood pressure patients.

This is a herbal program and works very slowly and in a gradual manner.

Typically it take about 6 months to 1 year to lower Creatinine at 1.2 mg/dL to 0.8 mg/dL and Cystain C at 1.2 mg/L to 0.7 mg/L.

The other thing I wanted to let you know is that herbs are intelligent phytochemicals which combine with the intelligence of the human body and continue to work for weeks after you stop taking them. Most herbs when correctly processed, conditioned and used, work as adaptogens with built in ability at multitasking and work in consonance with the intelligence and healing abilities of the human body.

This is an entirely different technology to so call "active ingredients" of pharmaceutical products which can therefore be considered to be passive chemicals with no intelligence of their own and can therefore be considered to be "dumb chemicals" in comparison.

It would therefore not be prudent to hurry into performing kidney tests in the near future, but if I was you, I would wait till my doses of hypertension prescription drugs like Losartan have been successfully reduced and stabalized to half the present dose. Lower blood pressure is a good indication of the health of the kidneys, which we are anyway monitoring on a daily basis.

So please be patient when you plan any blood test or medical investigation. Choosing the best and most opportune time to do these tests will save you frustration and unnecessary and avoidable expenses as well.

Analyzing the Strategy of this protocol

Testimonials of Cardiologists

Excellent reminder like CME for all concerned.
keep up the good work Dr. Vora.

A very logical way to understand important cardiology aspects from grass root level. Once your fundamentals are clarified then rest just automatically follows. You have indeed brought about your own unique method of simplifying cardiology-kudos Dr. Vora!

We should try to link up with your expertise which would benefit people
in this part of the world.

HAVE KNOWN THAT SALT RESTRICTION DOES NOT WORK EQUALLY FOR ALL HYPERTENSIVES BUT YOUR CONCEPT IS TOTALLY NEW BALL GAME TO ME WHICH I AM SURE AHA & OTHER SOCIETIES WOULD APPROVE IN TIME TO COME & CHANGE THE WHOLE IDEA OF SALT RESTRICTION SPECTRUM & HTN.
Kind regards
Dr. Ranjeet S. Baral MBBS, (JIPMER)
Ph.D.(Clinical Cardiology)
DCC (Health Ministry, JAPAN)
FAPSC (Fellowship cardiology)
Av.Med (King¹s College, London)
Consultant Cardiologist/Physician/Chief AME

Dr. Vora
Thank you for your review and updates about how to properly perform BP measurement.
Kenneth Phillips MD, FCCP

I thank you for your very comprehensive post on this so important subject. Invaluable information. I also visited your links, a gold mine of information. Thank you for sharing your knowledge...
Best Regards
Fernando M. Branco, Berlin, Germany.

Dear Dr. Pramod
I was astonished to find that you could use such a simple BP apparatus to use as a prognostic tool.
Really true functioning of the heart can be assessed not just by very advanced imaging technologies but also by simple tools.
Dr.Murali Krishna, Orthopedic Surgeon

Great post Pramod, If more GP's and hospitals adopted this approach the pharmaceutical industry would take a severe hit! Having the patient relax before taking a blood pressure may take extra time but it would almost certainly reduce anxiety and stress, which are inevitably the fundamental precipitators of Cardiovascular illnesses.

Adam Shaw, The Heart Guy at Adam Shaw Heart Wellbeing, St Albans, United Kingdom
---

Thank you so much for sharing with me. The articles you have written are awesome!!

I have been reading your articles all day long!! I am truly impressed with how you have taken what is so complicated for most of us to understand and made it simple. Thank you so much!! I look forward to using your therapies to not only heal myself but for my patients as well.
Dr. Michael Carter, M.D., Atlanta, Georgia

Dear Pramod Vora,
It is a great honor for me to connect with you. I am following your discussions and, can say so- I am learning from your experience. I am from Latvia, and, seems are the first in my country speaking about micronutrients in primary and secondary prophylaxis. You can imagine what a "wall" I meet by my colleges, working in classical medicine (following "evidence based" guidelines). I am graduated doctor in Internal medicine, but I have private practice where I am working with micronutrients. Actually in the field of orthomolecular medicine I am autodidact. I have really good experience by degenerative joint diseases and metabolic syndrome.
And, I just wanted to say, I am really thankful for your ideas, links etc.- this is a support for my daily practice.

regards,
Antra Briede, M.D.
Latvia

Dear Dr. Vora,

I find your comments very informative and thorough on Naturopathic Cardiology Group on LinkedIn.

I loved the hypertension material. It was a treat to read.

I trained under Dr. Martin Milner at NCNM in his heart and lung clinic.

It is serendipitous to be connected to you. You truly are exemplary in your dissemination of information, education and perceptive demeanor. I would love to meet you in person someday.

Shalini Kapoor
Naturopathic Physician
Portland, Oregon, USA

Some Unique Case Studies / Recommendations (Pitfalls for Misdiagnosis)

Reversing Left Ventricular Hypertrophy (LVH) in Ischemic Heart Disease (IHD) patients

Thiamine (vitamin B1) and magnesium play a very important part in reducing the severity of the symptoms of LVH in IHD patients.

For vitamins to work efficiently, and especially in the case of the entire range of B-Complex Vitamins, we should first ensure optimum levels of magnesium not only at serum levels but also at intracellular (RBC) levels.

While calcium helps muscles (including the heart muscles) to contract, magnesium helps muscles to relax. So having adequate levels of magnesium in the body is very important for the proper pumping action of the heart.

Again, Thiamin (vitamin B1) deficiency leads to heart enlargement. For Thiamin to work efficiently, it is advisable to take the entire range of B-Complex Vitamins from B1 to B12 as they work in conjunction with each other for energy metabolism. So taking a general B-Complex supplement is advisable to create a good foundation.

In addition, we need therapeutic doses of Thiamin (B1) and magnesium. Magnesium is required for the conversion of thiamin to its active form.

For the reversal of the symptoms of LVH, the daily intake of organically formulated minerals (which are administered in a synergistic manner with other supporting nutrients) must be as per the following therapeutic doses:

Thiamin (vitamin B1) – 10 mg twice a day for 2 to 3 months
Magnesium – 1000 mg in 3 or 4 equally divided doses for 6 to 12 months

These are therapeutic doses of nutrition which are specifically formulated to penetrate intracellular spaces where the nutrition is really required. This is known as Orthomolecular Medicine / Orthomolecular Nutrition. Doses mentioned above in mg are elemental weights.

Monitor your serum and RBC levels from time to time to ensure that you are actually raising the magnesium levels to the upper end of the Standard Reference Range:

Serum Magnesium = 1.8 to 3.0 mg/dL (0.7 mmol/L to 1.2 mmol/L)
(as per Internationally accepted Standard Reference Range)

Optimum Desirable Value: 2.4 to 2.8 mg/dL (1.0 mmol/L to 1.2 mmol/L)
(as per International Standards of Preventive and Anti-Aging Medicine)

Intracellular Magnesium
(also know as RBC Magnesium / Erythrocyte Magnesium)
Standard Reference Range = = 4.2 mg/dL to 6.8 mg/dL (1.75 mmol/L to 2.8 mmol/L)

Optimum Desirable Value = 5.5 mg/dL to 6.0 mg/dL (2.3 mmol/L to 2.5 mmol/L)
(as per International Standards of Preventive and Anti-Aging Medicine)

Make sure to discontinue magnesium supplementation for 7 days prior to drawing a blood sample to ensure that the values measured are the true retained values and are not skewed due to the recent supplements you took.

Also, check your renal profile to make sure that the serum mineral values reported in your blood report are not inflated due to poor filtration by the kidneys. To ensure your kidneys are working at optimum levels / efficiently, make sure your Renal Profile is as follows:

Creatinine = 0.8 mg/dL
Serum Uric Acid < 4.0 mg/dL
BUN ≈ 12.0 mg/dL

If these values are at the higher end of the reference range, it is possible that your mineral levels will appear above normal when they are really deficient.

If your protein intake is very poor, the Blood Urea Nitrogen (BUN) value will be at the lower end of the reference range. When this happens, protein based tests like creatinine will appear low and one may inadvertently pass this off as healthy kidneys when that is not the case.

If in doubt, about efficient working of the kidneys, do the Cystatin C test. This is a more sensitive test compared to a standard renal profile. Again this is a protein based test, so ensure adequate BUN levels to interpret the results of this test.

Optimum Desirable Value:
Cystatin C = 0.7 mg/L

Blessings,
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Reversing Dilated Cardiomyopathy (DCM)

Thiamine (vitamin B1) and magnesium play a very important part in reducing the severity of the symptoms of Dilated Cardiomyopathy (DCM).

For vitamins to work efficiently and especially in the case of the entire range of B-Complex Vitamins we should first ensure optimum levels of magnesium not only at serum levels but also at intracellular (RBC) levels.

While calcium helps muscles (including the heart muscles) to contract, magnesium helps muscles to relax. So having adequate levels of magnesium in the body is very important for the proper pumping action of the heart.

Again, Thiamin (vitamin B1) deficiency leads to heart enlargement. For Thiamin to work efficiently it is advisable to take the entire range of B-Complex Vitamins from B1 to B12 as they work in conjunction with each other for energy metabolism. So taking a general B-Complex supplement is advisable to create a good foundation.

In addition, we need therapeutic doses of Thiamin (vitamin B1) and magnesium. Magnesium is required for the conversion of thiamin to its active form.

For the reversal of the symptoms of DCM, the daily intake of organically formulated minerals (which are administered in a synergistic manner with other supporting nutrients) must be as per the following therapeutic doses:

Thiamin (vitamin B1) – 10 mg twice a day for 2 to 3 months
Magnesium – 1000 mg in 3 or 4 equally divided doses for 6 to 12 months

These are therapeutic doses of nutrition which are specifically formulated to penetrate intracellular spaces where the nutrition is really required. This is known as Orthomolecular Medicine. Doses mentioned above in mg are elemental weights.

Monitor your serum and RBC levels from time to time to ensure that you are actually raising the magnesium levels to the upper end of the Standard Reference Range. Make sure to discontinue magnesium supplementation for 7 days prior to drawing a blood sample to ensure that the values tested are the true retained values and are not skewed due to the recent supplements you took.

Also check your renal profile to make sure that the serum mineral values reported in your blood report are not inflated due to poor filtration by the kidneys. To ensure your kidneys are working at optimum levels / efficiently, make sure your Renal Profile is as follows:

Creatinine = 0.8 mg/dL
Serum Uric Acid < 4.0 mg/dL
BUN ≈ 12.0 mg/dL

If these values are at the higher end of the reference range, it is possible that your mineral levels will appear above normal when they are really deficient.

If your protein intake is very poor, the Blood Urea Nitrogen (BUN) value will be at the lower end of the reference range. When this happens, protein based tests like creatinine will appear low and one may inadvertently pass this off as healthy kidneys when that is not the case.

If in doubt, about the efficient working of the kidneys, do a Cystatin C test. This is a more sensitive test compared to a standard renal profile. Again this is a protein based test, so ensure adequate BUN levels to interpret the results of this test.

Optimum Desirable Value:

Cystatin C is 0.7 mg/L.

Trust you will find this information useful.

Blessings,
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Chronic Kidney Failure (CRF) or Ischemic Heart Disease (IHD)?

Here are my observations / recommendations after going through the last twelve months of reports.

Patient is in a very critical condition. I do pray that he comes out of this and can return back to his normal life soon.

We have two serious complications - one is the failure of his kidneys (he has been on dialysis for the past few months) and at the same time we have his heart at very low Ejection Fraction of 28% to 40%.

I see that he has been on Shelcal 500 mg (calcium 500 mg + vitamin D) twice a day for the last many months. We also see calcium deposits in the brain, an indication of excessive calcium (toxicity).

If your attending doctors agree, I would like to find out if they are comfortable discontinuing calcium + vitamin D supplementation for the moment. This will be helpful under the present condition and will allow the heart to work more efficiently. I would go one step further to recommend immediately administering magnesium sulfate injections to improve cardiac efficiency, after taking a decision to stop calcium + vitamin D supplements (twice a day). Magnesium can only be effective after stopping taking of calcium supplements. This will allow his heart to begin pumping more efficiently and the Heart's Ejection Fraction can be brought up to much safer value of 50% to 60% to enable the kidneys to begin working more efficiently. Raising serum magnesium levels may also help to dissolve excessive calcium deposits (in the brain for instance) from the body and reduce calcium toxicity.

Once this has been achieved the patient's chances of return to normal life will improve considerably.

The reason why the patient may have been put on calcium supplementation during the past months, could be to counteract the low serum calcium values. But, calcium is released from the bones to counteract the acidity of the blood, due to the inefficient filtration of the kidneys. The solution is to correct the blood pH by administration of sodium bicarbonate, which has been done in the past. The serum calcium values will automatically rise once the pH is successfully controlled. Administering calcium supplement will not really help to raise serum calcium values, as the calcium will be excreted out of the body due to the acidic pH of the blood.

Also, administering magnesium will help to raise serum calcium levels. This is how the human biochemistry works. Calcium and magnesium are antagonists and work in this manner. Calcium helps muscles contract and magnesium helps muscle relax. This is how the pumping action of the heart works, as the heart is a muscular organ, and needs both calcium and magnesium. If calcium is in excess, the heart stays contracted and does not relax properly to complete the pumping action. This results in low left ventricular ejection fraction (LVEF) and poor cardiac efficiency. Low pumping action of the heart also results in inefficient working of the kidneys.

Blessings,
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Please return to page 4 to continue with the reading of the Paper on Reversal of Hypertension – Primary and Secondary.

Some More Unique Case Studies

Sarita – Rheumatic Heart Disease or Calcium Toxicity?

History
Sarita is a young girl 9 years old, who two years prior, was diagnosed with Rheumatic Heart Disease with symptoms of breathlessness on exertion, swelling over both ankles and knee joint pain.

A recent 2D Echo Cardiogram has revealed Mitral Stenosis, AML thickened and calcific and PML thickened and calcific. aortic valve thickened, moderate MR and mild AR.

Prior Recommendation:
Patient is recommended surgical management for relief

Our Observations:
Breathlessness is so severe that Sarita is unable to attend school, which would require her to walk 4 km (3 miles) each way.

At our Health Center her Blood Pressure, Heart Rates and Cardiac Efficiency were very carefully checked. Here are our findings:

November 15, 2010
BP = 103 / 70 and Pulse P = 97 BPs(standing) = 99 / 64 and Ps (Pulse) = 81
(Rheumatic Heart Disease – AML, PML is thickened and calcific)

We observed a substantially falling heart rate by 16 bpm on standing up (exertion), instead of rising by 10 to 15 bpm. It was concluded that Cardiac Efficiency was very poor since it was also coupled with breathlessness. There was also evidence of calcification of AML and PML.

All this pointed to calcium toxicity and magnesium deficiency. Since the parents were not able to afford the cost of surgery, it was decided to use this window of opportunity to administer therapeutic doses of organic magnesium, at intracellular levels (fortified with other supporting nutrients) in a bid to alter the blood biochemistry to help dissolve the calcification of the AML and PML. Since calcium and magnesium are antagonist with each other, it was hoped that by raising intracellular and serum magnesium levels it would naturally allow the body to excrete excess calcium deposited in the body.

Her Progress:
Two weeks later the following reading were observed.

November 24, 2010
BP = 81 / 64 Pulse P = 93 BPs = 75/53 Ps = 85

The resting heart rate has come down from 97 to 93 and the heart rate on exertion (standing up) has increased from 81 to 85. The fall in heart rate on exertion has reduced from 16 bpm to 8 bpm in the first two week period. This was an encouraging sign and showed that her body was responding nicely and motivated us to explore this approach further.

Four weeks later the progress was much better than we anticipated.

December 12, 2010
BP = 96 / 64 and Pulse P = 80 BPs = 88 / 56 and Pulse Ps = 76

At this stage, four week after commencing therapeutic doses of organic magnesium at intracellular levels (fortified with other supporting nutrients) all symptoms of breathlessness have disappeared and Sarita is now able to join other children at play and can now run around like a normal child.

Sarita now walks 4 km (3 miles) to her school each way and also goes for tuitions in the evenings, to catch up with her lost years at school due to her heart condition, which is 2 km (1.5 miles) each way. Her body weight is improving and there is a healthy glow on her face.

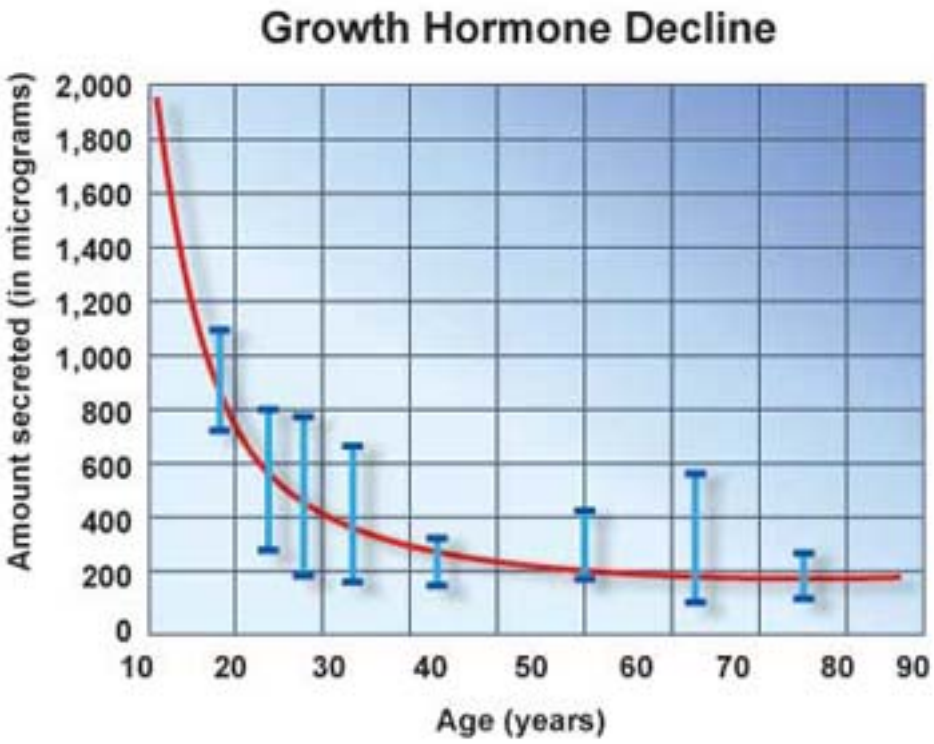
Two years later on October 14, 2012
Heart disease is a distant history and Sarita is now leading a normal life. Her body weight has gone up by 4 Kg. (9 lbs.)

This case is unique as the repairs to the heart are carried out by first dissolving calcification by a simple adjustment of the ratio of magnesium to calcium in the blood biochemistry. Magnesium and calcium are antagonists. So by raising magnesium levels the body was able to naturally excrete calcium. This has improved the pumping action of the heart and general health of the child.

Since the patient was below 11 years of age her growth hormone levels were at their peak and the body's stem cells have done the magic of repairing and rebuilding the heart.

One of the most important differences between an eleven year old child and a fully grown adult, as far as regenerative medicine is concerned, is the levels of growth hormones in their bodies. Growth hormone (GH) levels rapidly decline after the age of 11 years.

Human growth hormones (HGH) regulate more than just growth. Tissue repair, healing, cell replacement, organ health, bone strength, brain function, enzyme production, as well as the health of nails, hair, and skin all require adequate amounts of HGH.



In the case of adults it is possible to use precursors in the form of amino acids like arginine to enhance the release of growth hormones.

Incorporating the use of growth hormone precursors with the use of stem cell in the patients body, to stimulate the pituitary gland to increase growth hormone production, will ensure two important things. Firstly, it will result in a much higher efficiency in regeneration and repairing of organs in adults where growth hormone levels have declined. Secondly, it will also expand the scope of this regenerative medicine to healthy adults of any age and perhaps lay the foundation to regenerating other organs in adults as well.

Administration of multivitamin / mineral supplements to increase the availability of nutrition in the body will also help to improve the overall success rate of adult and child in regenerative medicine.

Altering the blood biochemistry to change the ratio of calcium to magnesium has improved the LVEF of the heart. Remember calcium helps contract muscles and magnesium helps muscles relax. Both actions, contraction and relaxation, are required by the heart which is a muscular organ to ensure its proper pumping action, i.e. LVEF.

How could Sarita possibly have landed in this problem?
The probable cause could be the over zealous use of calcium and vitamin D injections inadvertently administered by the family physician to help improve her health as a child. These injections may have actually caused calcium toxicity and calcification of the heart valves. Please refer to side effects of calcium and vitamin D mentioned earlier in this tutorial. Refer pages 57 to 66.

Blessings,
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Arpita – A Child Born With Neuromuscular Dysfunction is Good at High Jumps!

History:
Arpita is a young girl 12 years old who has been diagnosed with mild dyslexia (weak neuromuscular co-ordination). She also suffers from leg / muscle cramps and poor concentration. She has developed a stooping posture since early childhood.

In spite of these physical challenges, she is a sports person who excels at High Jumps at school level. Her mother and her two aunts are MDs in various specialties of medicine and believe, due to general consensus in the medical fraternity they belong to, that these are congenital defects and are therefore untreatable.

Our Observations:
Due to history of poor concentration and leg / muscle cramps, it was decided to check her ferritin levels to determine the existence of chronic anemia at intracellular levels, which most probably could have easily been passed on from mother to daughter at child birth.

Her blood report showed her hemoglobin was only 11.2 g/dL, while her serum ferritin was only 8.60 ng/mL, against an optimum level of 14.5 g/dL and 200 ng/mL respectively found in healthy people.

Her stooping posture and prior diagnoses of weak neuromuscular co-ordination was a dead give away of a serious intracellular magnesium deficiency. In spite of these odds Arpita could high jump about 1.30 meters (4ft 3 inches) and had secured position 3 at school level.

On November 09, 2011
BP = 97 / 56 Pulse P = 71 BPs (standing) = 98 / 53 Pulse Ps = 67
We noticed a fall in both her diastolic blood pressure and heart rate on exercising (standing up). This reflected poor cardiac efficiency.

On checking her blood pressure, heart rate and cardiac efficiency it became apparent that the earlier diagnoses of neuromuscular disease was actually a serious magnesium deficiency which was also clearly evident because of her stooping posture. Her heart rate fell on exercising, an indication of poor cardiac efficiency. A routine blood report further confirmed serum magnesium deficiency (1.97 mg/dL) against an optimum level of 2.4 mg/dL found in healthy people.

Since calcium helps contract muscles and magnesium helps relax muscles, it was highly probable that once the serum and erythrocyte magnesium levels were raised to optimum levels, Arpita's performance at high jump would improve substantially and would allow her to progress from school to state level and then to national level participation. Also, raising her hemoglobin levels to an optimum of 14.5 g/dL and ferritin to 200 ng/mL would improve her oxygenation level and allow her to perform better at a sport she was naturally good at.

Her Progress:
Her poor cardiac efficiency mentioned above was hampering her reaching her full potential as a sports person.

She was immediately put on therapeutic doses of organic magnesium (fortified with other supporting nutrients) and organic iron (fortified with other supporting nutrients) which were carefully formulated to work at quickly altering intracellular values.

Within 2 weeks of beginning intracellular magnesium therapy with other supporting nutrients, the stooping posture had magically disappeared and she was standing erect and tall for the first time in her life.

A few months later I got an e-mail (On 5/26/2012) from her mother:
" Arpita is doing well. She got gold medal in high jump with a performance of 1.38 meters (4 ft. 6.5 inches) at district level and has been selected for state level. " -:)

In May 2012 Arpita got a Gold Medal at District level - 1.38 meters (4 ft. 6.5 inches)

In September 2012 she got a Gold Medal at State level - 1.40 meters (4 ft. 7.5 inches)

On September 24, 2012 an excited mother called to tell me Arpita won Gold at National Level - 1.46 meters (4ft. 9.5 inches). Some more events are in the pipe line for this gifted under 14 year old.:-)

We wish her all the best.

On March 11, 2013 (15 months later)
Hemoglobin had increased from 11.2 g/dL in Nov 2011 to 12.9 g/dL
Ferritin had increased from 8.60 ng/mL in Nov 2011 to 179.15 ng/mL
Serum Magnesium had increased from 1.97 mg/dL in Nov 2011 to 2.12 mg/dL

On October 05, 2013
BP = 105 / 67 Pulse P = 64 BPs (standing) = 106 / 66 Pulse Ps = 67
Here we now see a slight increase in heart rate on exercising. Optimum would be if both the systolic / diastolic blood pressure and heart rate would increase by 10 to 15 points on exertion.

We still have a long way to go to bring Arpita's body to perfection, as would be required by a sports person. Hopefully, we can do this next year, after Arpita graduates from high school and can devote more time to health care and sports.

Please return to page 4 to continue with the reading of the Paper on Reversal of Hypertension – Primary and Secondary.

Hyperparathyroidism & Hypertension

Old Theory

The parathyroid glands maintain proper levels of both calcium and phosphorus in your body by turning the secretion of parathyroid hormone (PTH) off or on, much like a thermostat controls a heating system to maintain a constant air temperature. Vitamin D also is involved in regulating the amount of calcium in your blood.

Normally, this balancing act works well. When calcium levels in your blood fall too low, your parathyroid glands secrete enough PTH to restore the balance. PTH raises calcium levels by releasing calcium from your bones and increasing the amount of calcium absorbed from your small intestine.

When blood-calcium levels are too high, the parathyroid glands produce less PTH. But sometimes one or more of these glands produce too much hormone, leading to abnormally high levels of calcium (hypercalcemia) and low levels of phosphorus in your blood.

Complications of hyperparathyroidism are primarily related to the long-term effect of too little calcium in your bones and too much calcium circulating in your bloodstream. Common complications include:

Cardiovascular disease. Although the exact cause-and-effect link is unclear, **high calcium levels are associated with** cardiovascular conditions, such as **high blood pressure (hypertension)** and certain types of heart disease.

The reduce PTH levels and to prevent the loss of calcium from the bones (osteoporosis), the traditional approach has been to administer 500 mg to 1200 mg per day of elemental calcium.

New Theory / An Alternative Approach

PTH raises calcium levels by increasing the amount of calcium absorbed from your small intestine, reducing the daily calcium excreted in the urine and lastly in dire circumstances releasing calcium from your bones.

There is however another more potent method to achieve the lowering of PTH in a more natural way.

The body automatically maintains a ratio between magnesium and calcium levels. As magnesium levels rise, calcium levels automatically rise in order to maintain an ideal ratio.

This would be a natural method of maintaining high calcium levels to help lower PTH levels.

The most important aspect of the use of magnesium is that it is also a vasodilator, which means that it allows the expansion of blood vessels in the body, which automatically lower blood pressure.

continued on page 2 .....

So administering magnesium supplements will not only lower blood pressure through vasodilation, but will also naturally raise calcium levels which in turn will help reduce PTH levels.

In addition, magnesium also helps to increase bone density. Magnesium results in flexible bones which help reduce the risk of fractures, which is the ultimate goal for management of osteoporosis.

The internationally accepted upper end of the normal reference range of magnesium is 3.0 mg/dL. So in most cases there is ample scope to continue administering magnesium supplements for a prolonged period - typical 6 to 12 months. Periodic monitoring of calcium and magnesium levels is however recommended.

Another important nutrient which will be helpful, would be silicon to help lower blood pressure. Silicon is responsible for maintaining the elasticity of blood vessels. With age, blood vessels harden, which results in increased blood pressure. Elastic blood vessels also help to lower blood pressure.

Both magnesium and silicon will help improve bone density which is a risk factor in case of hyperparathyroidism. Attached please see the graph of how bone density can be increased through the use of magnesium and bio-identical progesterone. For detailed case study done please visit: http://www.space-age.com/BMD01.pdf

For the latest on osteoporosis, calcium, vitamin D and bone mineral density please visit: http://www.space-age.com/osteoporosis.html

Nutrients administered at intracellular levels take time to show results. First step should be to take 2 capsules of 180 mg each of elemental magnesium twice a day for the next 90 to 180 days.

It would be prudent to stop calcium supplements on starting magnesium. Calcium and magnesium are antagonist. High dose calcium (elemental 500 mg and greater) will block the absorption of magnesium.

High blood pressure can be a result of trying to artificially raise calcium levels through high dose calcium therapy in the body in a bid to reduce PTH (Parathyroid hormone) levels.

There is a definite link between high dose calcium (in the range of 500 mg to 1200 mg elemental calcium per day) and high blood pressure. High dose levels of calcium result in lowering magnesium levels (as these are antagonists). Lowered magnesium levels result in high blood pressure due to the reduction in the vasodilation of all blood vessels.

Reverse Logic and Calcium Requirements of the Human Body
Scope for Misdiagnosis

The reverse logic as to the connection between calcium and magnesium being antagonist to each other also applies.

When we see low serum calcium levels in a blood report, we tend to think that calcium is low and therefore recommend the patient to start taking calcium.

But as more calcium is added to the body, the magnesium levels sink still lower. In a bid to maintain adequate ratio of calcium to magnesium, the excess calcium determined by the body is now excreted in the urine.

As magnesium levels fall, the serum calcium levels sink still further and now we have put the patient on a life long supplementation of calcium with no results in sight.

On noticing low serum calcium levels, in spite of prior calcium administration, had we begun administering magnesium, the serum calcium levels would have automatically risen, as less calcium would have got excreted in the urine and PTH would have increase absorption of calcium from the intestines.

How Much Calcium Does an Adult Really Need ?

Let us try and understand how much calcium does the human body need.

Calcium concentration in mother's milk
Calcium concentrations, reported in various studies, vary from 25--35 mg/100 mL.
From 1 month to 6 months, the intake of breast milk is about 750 mL. This means that the total calcium delivered to a baby's body through breast feeding is about 35 mg X 7.50 = 262.5 mg approximately.

Assuming approximately 750 mL of mother's milk is required by a one to six month old baby, the daily intake of calcium is approximately 250 mg per day. With this amount of calcium in daily diet, the child is able to grow to double its size every few months and the baby's skeleton grows at a healthy rate.

In adults, where the body has stopped growing and the skeleton is fully formed, the requirement of calcium should automatically be far less, not far more. Excess calcium supplementation will only result in urinary excretion of calcium. If the calcium intake is too high and the kidneys are not able to cope with this extra load, it will result in the deposition of calcium in soft tissues, calcified arteries, calcified heart values, kidney stones, osteophytes, heel spurs, etc. This is know as calcium toxicity or calcium poisoning.

We truly live in a calcium toxic society today, with rampant osteoporosis.

This is an example of the pitfalls of reading only highs and lows of a blood report without proper analysis.

It is obvious from the above, that in the case of full grown adult, the daily requirement of calcium will be far less.

Administering 500 mg or 1,200 mg of elemental calcium (in the form or calcium carbonate) will only result in calcium deposits being formed in various locations in the body as the kidneys will not be able to cope up with the load of this excess calcium.

The Standard Reference Range for 24 hour urinary excretion of calcium is 50 to 350 mg. From this we know that the kidneys of a healthy individual can excrete a maximum of 350 mg of calcium per day. High dose calcium of 500 mg to 1200 mg per day will definitely put a load on the kidneys, which they are not designed to cope up with. This will result in calcium deposits in various locations of the body.

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Blessings,
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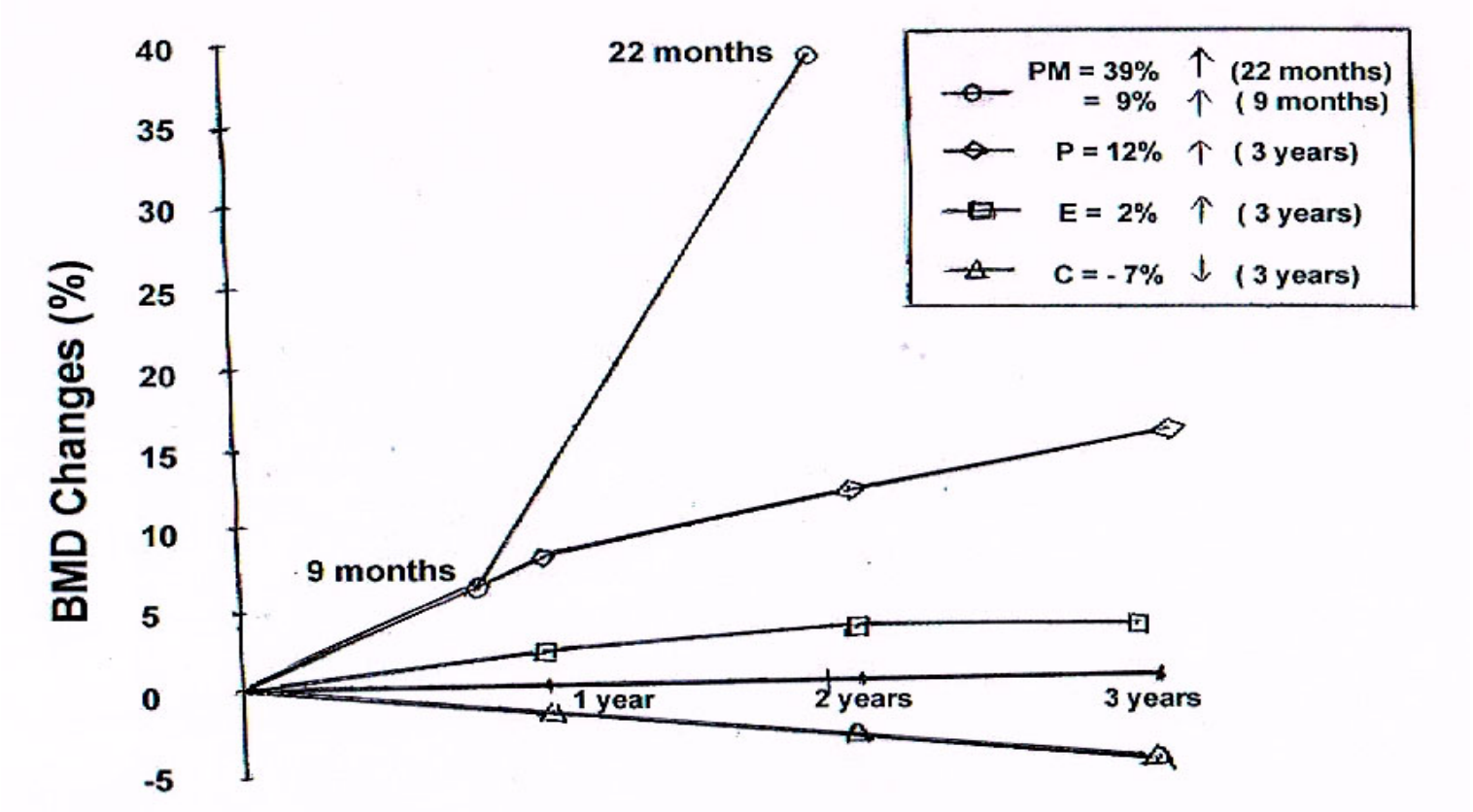
Natural Progesterone + Magnesium Stimulates Bone Building



Typical 3 years Bone Mineral Density (BMD) changes using:

a) Bio-identical Progesterone + Orthomolecular Magnesium (PM);

b) Bio-identical Progesterone (P);

c) Estrogen only (E); and

d) Control (C) (i.e., without Bio-identical Hormone and / or Calcium Therapy

Appendix - VIII

Cadmium Toxicity Induced Cardiac Diseases and Renal (Secondary) Hypertension

Toxic Metal	Std. Ref. Range	Optimum Levels
Cadmium	**< 1.5 µg/L**	**< 0.15 µg/L**

Side Effects of Higher Than *Normal Levels of Cadmium in the Body:

(* Normal values as encountered in population not exposed to cadmium toxicity)

Renal Diseases

Many of the side effects of cadmium are the result of its accumulation in the kidneys.

Renal insufficiency / impaired filtration results in falsely elevating all mineral levels such as calcium, magnesium, zinc, copper, iron, sodium, phosphorus, etc and can result in proteinuria, glycosuria, renal (secondary) hypertension and other metabolic disorders.

Cardiovascular Diseases

One of the side effects of cadmium is that it displaces zinc in the various parts of the body.

Zinc is required to maintain flexibility and strength of the arteries. When zinc is displaced by cadmium, the body will begin to coat the arteries to prevent aneurysms, resulting in atherosclerotic plaque and narrowing of the arteries, which in turn results in primary hypertension, enlarged heart and the need to resort to CABG - Coronary Artery Bypass Surgery.

Zinc is required to maintain elasticity of arteries. Cadmium causes arteries to harden and become more vulnerable to rupture. To prevent this from happening, the body then deposits calcium plaque to strength the arterial wall. Hardened arteries result in high blood pressure / tachycardia.

Concentration of cadmium in the kidneys results in renal arteriosclerosis which in turn manifests as renal induced (secondary) hypertension and water retention.

Zinc is required for the proper metabolism of fats. By displacing zinc, cadmium can contribute to atherosclerosis, hypercholesterolemia and hyperlipidemia. Higher levels of fats can also impair liver function (fatty liver).

Impaired liver function can result in inability to neutralize allergens (body will manifest allergies) and synthesize much needed hormones for the normal operation of the human body and / or cause PCOD / PCOS.

For more information on:
Reversal of Hypertension - Primary and Secondary
& Improving Cardiac Efficiency
please visit: http://www.space-age.com/HighBloodPressure.pdf

Toxic Heavy Metal Testing

Toxic Metals	* Whole Blood Levels in Unexposed Population	ThyroCare, Mumbai, India	LabCorp., USA	Quest Diagnostics, USA	Possible Sources Remarks
Aluminum Serum	1.0 µg/L (Serum)		3 to 9 µg/L Plasma / Serum	1.0 to 20.0 µg/L Whole Blood	Cooking in aluminum pots and pans with damaged Teflon coating. Aluminum cans for Beer / soft drinks. High levels found in Alzheimer's patients
Arsenic Whole Blood	0.5 µg/L	0.1 to 5 µg/L Whole Blood	2 to 23 µg/L Whole Blood		Ground water, sea food. Causes: pigmentation, renal + hepatic toxicity, hypertension, Diabetes.
Cadmium Whole Blood	0.15 µg/L	0.1 to 1.5 µg/L Whole Blood	0.1 to 1.2 µg/L Whole Blood		Tobacco, cigarette smoke, KDM gold jewelery and canned foods. Causes: cardiac diseases, peripheral cyanosis.
Lead Whole Blood	15 µg/L	10 to 150 µg/L Whole Blood	10 to 190 µg/L (1 to 19 ug/dL) Whole Blood		Paint, cosmetics, leaded petrol. Causes: reduced motor skills / hypertension. high uric acid (gout) and urinary microalbumin.
Mercury Whole Blood	0.5 µg/L	0.1 to 5.0 µg/L Whole Blood	0.1 to 14.9 µg/L Whole Blood		Fish, sea food. Causes: kidney insufficiency / failure, high uric acid (gout) and urinary microalbumin.
Nickel Serum	0.2 µg/L (Serum)				Cooking in stainless steel pots /pans, costume jewelery, stainless steel body parts. Deposits in Prostate cause Prostate Cancer.
Essential Micro Nutrients	**Levels in Healthy Population**	**ThyroCare**	**LabCorp**	**Quest Diagnostics**	**Remarks**
Chromium Whole Blood	5.0 to 10 µg/L	1.0 to 30 µg/L Whole Blood	0.1 to 2.1 µg/L Plasma	0.1 to 1.4 µg/L Serum	Helps lower insulin, blood sugar and Inflammation.
Selenium Whole Blood	300 to 350 µg/L	60 to 350 µg/L Whole Blood	79 to 326 µg/L Serum / Plasma		Lowers arsenic and mercury levels. Improves Thyroid function; and Testosterone in males.

* = Levels found in unexposed population as indicated by the Department of Toxicology, U.S. Department of Health and Public Health Services; and levels that have been repeatedly achieved at our Health Center after an eleborate Heavy Metal Detoxification Program.