Chiropractic Nutrition Module 2

By:
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WCA 48 Hr Nutrition Certification Module 2: Day 1

48 Hr Nutrition Certification Outline

- Module 1
  - Importance of nutrition/lifestyle medicine
  - Nutrition and body chemistry
  - Macronutrients: Protein, Carbohydrates, Fats
    - Artificial sweeteners, alcohol, fiber
  - Water and hydration
  - Micronutrients: Water/Fat soluble vitamins, Minerals/Metals
    - RDAs, deficiency, toxicity, therapeutic considerations
  - Conditionally essential nutrients
  - Glandulars & therapeutic enzymes
  - Organic Foods and Health

48 Hr Nutrition Certification Outline

- Module 2
  - Nutritional counselling
  - Nutritional screening/diet history assessment
  - Nutritional exam & testing
    - In-house testing
    - Laboratory data
    - Functional testing
  - Supplements and Nutrition
  - Supplement quality
  - Codex Alimentarius & DSHEA
  - Nutrient-Drug-Food Interactions

48 Hr Nutrition Certification Outline

- Module 3
  - Supplementation and Nutrition
  - Standard American Diet
  - Organ system dysfunction, diseases and conditions
    - Including etiology, signs & symptoms, lab/nutritional assessment and management with nutraceuticals/nutrition

Inflammation	Musculoskeletal Conditions
Gastrointestinal Disorders	Cardiovascular Conditions
Nervous system Conditions	Immune Conditions
Respiratory Conditions	Endocrine Conditions
Urinary Conditions	

48 Hr Nutrition Certification Outline

- Module 4
  - Nutrition across the lifecycle

Pregnancy/lactation	Infant nutrition
Children/adolescent	Teens
Young adults	Geriatrics

    - Nutrition & common conditions
      - Therapeutic use of diet & nutraceuticals
  - Obesity management and control
    - Children and adults
  - Sports nutrition

Module 2

- Nutritional counselling
- Nutritional screening/diet history assessment
- Nutritional exam & testing
  - In-house testing
  - Laboratory data
  - Functional testing
- Supplements and Nutrition
- Supplement quality
- Codex Alimentarius & DSHEA
- Nutrient-Drug-Food Interactions

Creative Consulting
Sustaining the Relationship
Facilitating Change

The Art of Coaching and Facilitating Change

Objectives

- Explore counseling skills that build long-term coaching relationships
- Learn behavior change techniques
- Facilitate changes in patients' beliefs and choices related to health and wellbeing

Behavior Change is More Than Information

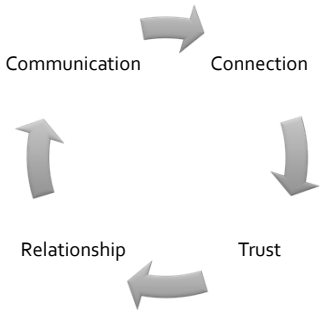
Nutrition & Lifestyle Education
- Content-based (learning assumed)
- Short-term
- Improve knowledge and skills
- Work on behaviors
- Address cognitive defects
- Success measured objectively (e.g., knowledge, behavior change)

Client-Centered Coaching
- Open-ended (based on clients needs)
- Long-term
- Relationship oriented; coach is the trainer
- Resolution of issues and barriers
- Work on thoughts, feelings and behaviors
- Address motivation, denial and resistance
- Success measured subjectively (e.g., happiness, mood shift, relationships)

Effective Coaching is a Problem Solving Discussion That…

1. Is directed toward helping a person achieve *their* goals.
2. Guides the client through a discussion allowing them to develop ways to identify obstacles and create solutions that resolve the problem.
3. Is not about what the coach/trainer knows – it is about what your client can figure out with your help and direction.
4. Requires agreement, consistency, formality and skill.
5. May result in referral for psychotherapy/counseling.

Creative Consulting



Creative Consulting…

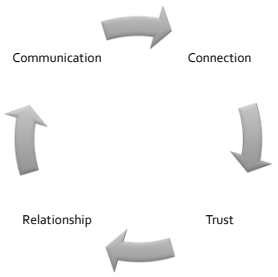
- Is client-centered
- Relies on a way of being, conversing and questioning that 'intentionally' supports positive change
- Promotes self-discovery and self-confidence
- Develops intuition and insight, encourages spontaneity, a sense of adventure and excitement
- Replaces despair, hopelessness and helplessness with 'possibilities' so behavior change does not have to rely solely on 'will power', 'miracles' or 'near death' experiences to succeed

Elements of Creative Consulting

- Caring
- Being present
- Empathy
- Active listening
- Honesty
- Questioning to promote self discovery
- Empowering language
- Encouraging choice
- Sharing/reciprocity
- Walking the talk

Communicating that you Care

- Warm greeting
- Body language
- Practice just listening
- Timing
- Physical appearance
- Physical setting
- Privacy – a special place



Making a client feel valued

- Does the office staff/you communicate caring?
- If you communicate in writing, is your 'Introductory letter' or brochure informative and inspiring?
- Is your phone greeting 'welcoming'?
- Timing – are you on time all the time?
- Is your office space client friendly?
  - Physical appearance – fresh, clean, uncluttered?
  - Comfortable/inviting?
  - Ambiance – lively/energized, noisy, serene?
  - Consultation area – private, special, safe?

Being Present

- Absence of intention or personal agenda
- Active listening
- Shedding of moral judgments and preconceptions
- Awareness
- No attempt to sustain the experience
- Receptivity
- Present to uncertainty

EVERY Experience is Unique

"In spite of all similarities, every living situation has, like a newborn child, a new face, that has never been before and will never come again. It demands of you a reaction that cannot be prepared beforehand. It demands nothing of what is past. It demands presence, responsibility; it demands you."

- Martin Buber, Israeli Philosopher

Absence of Intention or Agenda

Distinguishing Moral from Value Judgments

- Moral judgments imply wrongness or badness on the part of people who don't act according to your values
  - Blame, insults, put-downs, labels, criticisms
    - Shame, guilt, fear, anger
- Value judgments reflect your beliefs about how your life can be best served
  - Honesty, freedom, peace, vegetarianism, physical fitness, etc.

Choose to show up and dance

- Create a personal ritual or ceremony that helps you become present
  - Deep breathing
  - Drink a glass of water
  - Take a moment of silence
  - Review client information for a few minutes prior to session
  - Meditate…

Empathy

Who are *you*?
What do *you* feel?
What do *you* think?
What means the most to *you*?

These are the questions empathy seeks to explore.
- Arthur Ciaramiocoli, EdD, PhD

From "So What If My Diet Is Killing Me? Inspiring Patients to Change" IFM Symposium, The Heart On Fire 2003. presented by Kathie Swift, MS, RD

What is Empathy - Distinctions

- Empathy – The respectful understanding of what others are experiencing. The capacity within your imagination, or heart to *understand* where the person is at.
- Compassion – The ability to stay *connected* from the heart to an individual under the worst of circumstances.
- Sympathy – To *feel* another person's feelings. Resonating into the pain of others.

What Does Empathy Look Like?

- Encourages the client to be the expert about change
- Facilitates the expression of feelings
- Encourages self-reflection, self-inquiry and self-discovery
- Allows one to stay vulnerable
- Defuses potential violence and anger (non-adversarial)
- Helps us hear the word 'no' without taking it as a rejection

Active Listening

- Encourages storytelling – sharing, creating and changing stories
- Supports self-expression, self-awareness and trust
- Promotes connection
- Creates opportunity for meaningful inquiry and dialogue concerning health issues
- Discovery of 'common ground' with clients you don't like
- Requires pacing yourself to finish on-time

Common Behaviors that Block Active Listening

Advising	Patient: "I'm disgusted with how heavy I am getting." Practitioner: "Perhaps jogging would help."
One-upping	Practitioner: "You think that's bad. Wait till you hear what happened to…"
Educating	Practitioner: "This could turn into a very positive experience for you if you just tried…"
Consoling	Practitioner: "Nobody is perfect. You're too hard on yourself."
Self-Stories	Practitioner: "That reminds me of the time when I…"

- Advising and educating should NOT occur while you are connecting with the client.
- They can occur later once you have collected all your information, have transitioned into your recommendations and have establish a rapport with your client.

More Common Blocks to Active Listening

Shutting Down	"Things will get better. Don't feel so bad."
Sympathizing	"I know how you feel. I used to feel that way too."
Correcting	"That's not how it works…"
Interrogating	"When did this begin?"

- Questioning/interrogating can/should occur once the client has been heard in order to gather more information
- Correcting can also occur once the client has been heard, HOWEVER, unless the client is radically off-base, it is usually better to steer them in the right direction rather than matter-of-factly tell them they are incorrect

Honesty

- Choose to be yourself moment to moment
- Sharing and providing feedback truthfully and respectfully
- *Acknowledging a disconnect, tension, uncomfortable feelings as they arise*
- Setting limits and living them session-to-session
- Being comfortable with saying "I don't know"
- Knowing when to refer

Question to Promote Self-Discovery

- Choose words that clarify problems, feelings, needs and requests
- Introduce the concept of empowering language
- Use words an individual understands
- Promote personal choice

Verbatim Feedback

Promotes Self Discovery Through Clarifying Questions

- Repeat sentences that are emotionally charged
  - So, let me repeat, I heard you say, "you hate your body?"
- Ask clarifying questions that reveal your understanding and elicit corrections to your understanding from the client
  - "Are you feeling ____ because you are needing ____?"
  - "Are you feeling _____ because you would like to have more _____ for your _____?"
- Ask *before* offering advice or reassurance

Expand Your "Feelings" Vocabulary

WHEN OUR NEEDS ARE BEING MET	
Adventurous	Excited
Affectionate	Free
Alert	Gratified
Alive	Grateful
Amused	Hopeful
Breathless	Interested
Calm	Mellow
Cheerful	Secure
Carefree	Stimulated
Curious	Touched
Delighted	Tranquil
Energetic	Trusting
Enthusiastic	Warm
	Wonderful

WHEN OUR NEEDS ARE NOT BEING MET	
Afraid	Embarrassed
Alarmed	Fatigued
Aloof	Guilty
Anxious	Heavy
Ashamed	Helpless
Bored	Impatient
Concerned	Indifferent
Confused	Intense
Depressed	Jealous
Detached	Miserable
Disappointed	Puzzled
Helpless	Restless

Help Translate "Have to…" to "Choose to…"

- Replace language that implies lack of choice with language that acknowledges choice
- "I have to…" becomes "I choose to____ because I want _____" OR "I want to _____ because _____"
- "You make me feel…" becomes "I feel _____ when you do _____"

Requesting & Encouraging Choice

- Suggestions to inspire compliance:
  - Request in clear, positive, concrete action language to reveal what is really expected
    - Vague, abstract, ambiguous phrasing supports not acting
  - Focus the request on the positive behavior
  - Communicate a request indicating your desire for them to comply "only if they can do so willingly" (a request perceived as a demand produces resistance)
  - Check in to see if the message sent is the message received – ask the client to reflect it back

The Process of Personal Growth

Patience and humor helps

- Stage 1: Emotional Slavery
  - We see ourselves responsible for others' feelings
- Stage 2: Challenging (possibly difficult)
  - We feel angry; we no longer want to be responsible for others' feelings
- Stage 3: Emotional liberation
  - We take responsibility for our intentions and actions & differentiate our feelings from others'
- Note: This is typically NOT a straightforward progression (i.e., Stage 1->2->1->2->3->1…->3)

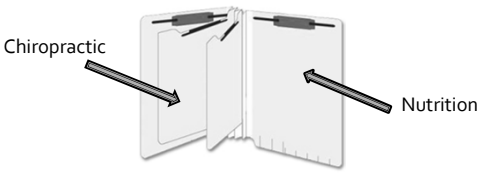
Getting Started

- Notice "where you are at" before seeing each client
- Choose to be present for each visit
- Gently observe, without judgment, the frequency with which you 'disappear/check out' from conversations
- Notice client resistance and how you respond
- Ask how the client feels about each session and listen without judging them or yourself
- Tell the truth with love/caring – be clean/authentic
- Let go of the outcome
- Enjoy the journey

Role Play – Making it Real

Creating a Patient Folder

- One chart/folder for each patient
- Divide in 2 sections: Chiropractic & Nutrition
- Objective information on the left (client info, pictures, labs, medical release, objective tracking forms)
- Subjective information on right (chart notes, initial intake forms, progress reviews, etc.)



How to Structure Consultations

- Initial consultation
- Initial testing/interview
- Data review & research
- Report of findings
- Follow up testing/consultations

Initial Consultation

- 20-30 minutes
- Lower fee
- Review main health concerns/goals
- Describe who you are/what you do
- Recommended next steps/testing
  - "Does this fit what you are looking for?"
- Review paperwork to complete & costs
- Address questions
- Complete/send medical release(s)
- Schedule future testing/visits

Getting Patient Buy-In

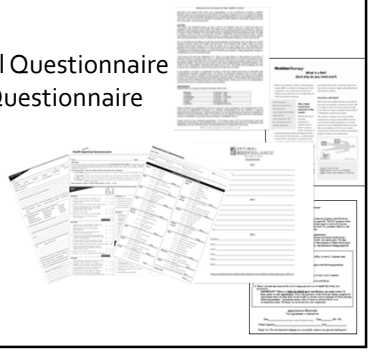
- Ask for questions/concerns & address them
- Find their past disappointments
- Lay out a plan of action
- Review all costs involved
- Get their 'buy-in'
- Ask them which way they are headed
- Let them know you want to help

Hints & Ideas

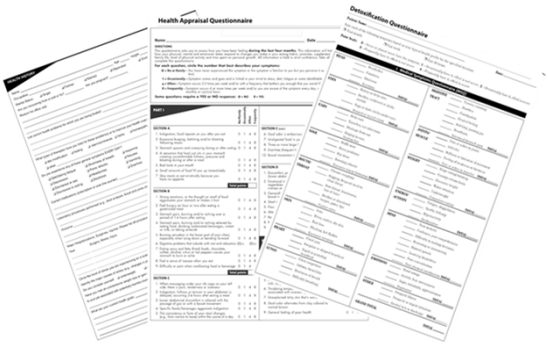
- Give them:
  - Your contact information
  - Appointment reminder card
- Get from them:
  - All/best contact information
  - Payment for visit
- Set up:
  - Appointment reminder x2 – phone/email/mail
  - Next appointment(s) – testing/interview

Client Welcome Packet

- Welcome letter
- Health Appraisal Questionnaire
- Detoxification Questionnaire
- Health History
- Diet Journal
- Exercise Log
- BIA Brochure



Health Appraisal & History

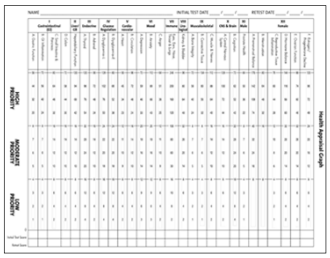


Health Appraisal Questionnaire

Organ Systems Assessed:

- Gastrointestinal
- Liver & Gallbladder
- Thyroid & Adrenal
- Glucose Regulation
- Cardiovascular
- Mood/Neurotransmission
- Immune, EENT & Lungs
- Kidney and Bladder
- Musculoskeletal
- CNS & Brain
- Male Health (Prostate)
- Female Health

HAQ Graph and NRG



Reassess every 3-6 months to document progress

Health History

Keep a Journal

- Diet/Exercise/Sleep/Stress
  - Use online journal or other tracking forms
    - Look over the journal with client at each visit to determine if the diet and lifestyle modifications are happening and to what extent
    - Identify issues surrounding lifestyle changes
      - Their resistance to change
    - Discuss emotional responses to making changes

Diet/Exercise/Sleep Log

Name: _____	Day 1	Date:
	Wake up:	
Please complete your "Diet Diary / Exercise Log" every day.	Morning Meal	
1.) Make note of the time you wake up.		
2.) List and describe in detail all foods and drinks including the amount of each. Make note as to whether the food was fresh, frozen, canned, raw, cooked, baked, fried, etc. Note the time of each meal or snack. Be sure to list everything you eat or drink.	Time:	
	Snack	
	Time:	
	Mid-Day Meal	
	Time:	
	Snack	
3.) Keep track of how much water you drink and list the amount in ounces in the section provided. Also note the type and amount of any other drinks you consume.	Time:	
	Evening Meal	

Diet/Exercise/Sleep Log

3.) Keep track of how much water you drink and list the amount in ounces in the section provided. Also note the type and amount of any other drinks you consume.	Time:	
	Evening Meal	
4.) Write down any activity or exercise you do in the section at the bottom, listing the kind of exercise you did and for how long you did it.	Time:	
	Snack	
	Time:	
5.) Note any periods of relaxation and what kind of relaxation it was.	Water (ounces)	
6.) Note the time you go to sleep.	Other Drinks (that are not listed with meals or snacks above)	
	Activity/Exercise	
	What kind:	
	How long:	
	Relaxation type:	
	How long:	
	sleep time:	

Food Journal Page

Date:	
Daily Goal:	
Breakfast:	Protein: Fat: Fruit/Whole Grain/Starchy Vegetable: Non-starchy Vegetable:
am Snack:	Protein: Fat: Fruit/Whole Grain/Starchy Vegetable: Non-starchy Vegetable:
am Snack:	Protein: Fat: Fruit/Whole Grain/Starchy Vegetable: Non-starchy Vegetable:
Dinner:	Protein: Fat: Fruit/Whole Grain/Starchy Vegetable: Non-starchy Vegetable:
Water (ounces)	1 2 3 4 5 6 7 8 9 10
Appetite:	
Activity (duration):	
Sleep (hours and quality):	
Supplements:	Morning: Noon: Night: / Taken as directed?
Obstacles Encountered:	
Obstacles Overcome:	
Food Options Used (meals):	
Notes (stressors, mood, energy, etc):	

Food Journal

- Makes eating conscious
- Free
- Takes little time
- Can do on paper or online
- If weight loss is a goal, they will lose 2x more

Kaiser Permanente (2008, July 8). Keeping A Food Diary Doubles Diet Weight Loss, Study Suggests. Science Daily. Retrieved September 13, 2011, from http://www.sciencedaily.com/releases/2008/07/080708093138.htm

Online Food Journal Options

- My Fitness Pal (www.myfitnesspal.com)
- Fit Day (www.fitday.com)
- My Calorie Counter (www.my-calorie-counter.com)

Initial Testing/Interview

- Get them back in ASAP
- Have staff check/score paperwork
- Complete initial in-house testing
- Review how to do functional testing (PRN)
- Initial interview – base on IC & HAQ

The Initial Testing/Interview

- Collect information
  - BIA / Body composition data
  - Health Appraisal & History Questionnaire
  - Detoxification Questionnaire
  - Diet Journal
  - Exercise Log
  - Client's health goals
  - Assess readiness to change
- Begin education and health coaching

Listen & Explore

"It is more important to know what patient has the disease than to know what disease the patient has." - Sir William Osler

- Studies show:
  - Patients spoke, uninterrupted, an average of 12 seconds after the doctor enters the room
  - Doctors interrupt patients 25% of the time before they finish speaking
  - Average time with patients ~11 min; patients speaks ~4 min

Fam Med. 2001 Jul-Aug;33(7):528-32. **Speaking and interruptions during primary care office visits.** Rhoades DR; McFarland KF; Finch WH; Johnson AO.
http://articles.mercola.com/sites/articles/archive/2008/01/12/doctors-interrupt.aspx

Potential areas to explore

- Client goals - you may have to articulate
- Health history (have them provide summary)
- Energy/pain levels/fluctuations
- Bowel habits
- Sleep habits/patterns
- Stress level & major stressors
- Diagnosed conditions
- Current medication use & current providers
- Dietary patterns/preferences
- Line of work, hours, stress
- Physical activity
- Support network/relationships
- How to make recommendations most useful to them

Initial Interview

- Most important health concern(s)
  - Begin with open ended questions
    - "Tell me about your chronic pain"
    - Gather information

Location	Intensity
Onset	Characteristics
Duration	Associations
Radiate/refers	Relieves
Frequency	Aggravates

Use Health History Information

- Use information from Health History form to probe and direct conversation
  - "I see here that you have seasonal allergies; when did you first start to notice symptoms…"
  - Look for anything not divulged during interview and explore
    - Major illness, trauma, surgeries, stress level, medications, family history

SOAP Notes:
Subjective is everything they've told you
Objective (chart notes) is repeat observations, labs, measurements
Assessment is the "diagnosis", summary of symptoms, list of concerns
Plan is everything prescribed/ recommended that day

Name_____ Age_____ Date_____

S:

O:

A:

Plan
1. _____
2. _____
3. _____
4. _____
5. _____

Labs:

Follow up:

year old F/M

Date										
Age										
Fasting/Non-fast										
Time of Day										
Menstrual cycle										
Pulse										
Height										
Weight										
Waist Circ.										
Hip Circ.										
WHR										
BMI										
BP										
Resistance										
Reactance										
Phase Angle										
TBW-L										
TBW %										
ICW-L										
ICW %										
ECW %										
ECW-L										
Fat-lbs										
Fat %										
FFM-lbs										
FFM %										
BCM-lbs										
BCM %										
ECM-lbs										
ECM %										
BMR										
FLT Calories										
MSQ/HPQ										
NTT										
DASS-D										
DASS-A										
DASS-S										
Cholesterol										
Triglycerides										
HDL										
LDL										
Trig HDL										
Chol HDL										
Glucose fasting										
Insulin fasting										

Diet Journal / Exercise Log

- Are you filling yours out daily?
- Keep track of:
  - Everything you eat
  - Everything you drink
  - Your activity/exercise

➢ People who self-monitor both eating and exercise behaviors are more successful at reaching and maintaining their ideal weight

The American College of Sports Medicine. (Med Sci Sports Exerc 2001 Dec;33(12):2145-56)

How to Do a Journal Review

- Be nice
- What to look for:
  - Eating regularly throughout the day
  - Composition of meals/snacks
  - Eating out / Choices made
  - Problem areas
    - Snacks, sweets, alcohol
    - Times of day, days of week
    - People, situations (parties, travel, etc.)
- Highlight areas and make a plan

How to Do a Journal Review

- Ask Questions
  - How are you doing on the dietary plan?
  - What 3 things are you most proud of this week?
  - Can you show me your 'best' day this week?
  - What are some good choices you are making?
  - Are you working out? How is that going?
  - What would you like to do better this week?
  - What is your biggest motivator this week to do well?
  - What are you S.M.A.R.T. goals for this week?

SMART Goals

Specific – Measureable – Attainable – Realistic – Timely

- Habits to work on this week

1. _____
2. _____
3. _____

Determining Health Goals

FirstLineTherapy
Establishing Your Health Goals

Date _____
Name _____
Age _____
Gender _____

Health Goals	Change +/-	Stage of Change	Technique/Plan
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

Uncovered During the History Taking in Initial Interview

SMARTER Health Goals

Name _____ Date _____ Age _____ Sex _____

Column 1: **Health Goals**
List health goals based on priority.

Column 2: **Behavior Change (+/-)**
Does this goal require adding or eliminating a behavior?
If so, identify the behavior change required.

Column 3: **Action Step**
What is the most important action step to accomplish this goal?

Column 4: **Timeline**
What is your timeframe for taking action?

SMARTER Health Goals are:

- **S**pecific. In other words, they are not vague or broad.
- **M**easurable. You can measure your progress at any point along the way.
- **A**ctionable. Simply put, you can act upon your goals.
- **R**ealistic. They are attainable—challenging, but within reach. You also should be sure to choose goals that motivate you.
- **T**imely. They have a reasonable timeline—you have ample time to complete your goal, but not so much time that you lose focus or motivation.

Most importantly, once you've tried to achieve your goals, you may discover you need to adjust them so that you stay on track. Work the EA...

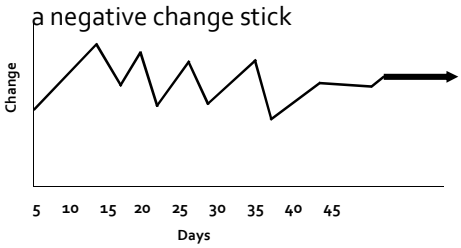
- **E**valuate them daily for their relevance and ability to keep you motivated. Ask yourself, "Am I following through?"
- **R**eassess your goals and action steps often. Make adjustments if necessary.

Health Goals	Behavior Change (+/-)	Action Step	Timeline
1.			
2.			
3.			
4.			
5.			

FirstLine Therapy

How long does change take?

- It takes a minimum of 45 days to make a positive change stick, yet only 7 days to make a negative change stick



Initial Interview

- Always ask:
  - What do you think is happening/what caused this?
- Always close with:
  - Is there anything else you'd like to tell me or that you'd like me to know?

Determining How to Change

- Changing for good

- James Prochaska, PhD
- John Norcross, PhD
- Carlo DiClemente, PhD

- Helps determine where one is at in the process of change and provides tools to use in each stage to facilitate change

Data Review & Research

- Review Goals
- Subjective Data
- Objective Data
  - General to specific
- Do research (PRN)
- Develop recommendation outline
- Make specific recommendations

Report of Findings

- Review goals, overall assessment and plan
  - General to specific
  - Dietary guidelines
  - Treatment plan
  - Supplement recommendations
  - Checklist for success
    - Step-by-step to keep them on track & focused
- Answer questions
- Schedule for follow up testing/consultations

How to Structure Consultations

- Lower the barrier to entry
- Define client goals
- Determine most likely area(s) of imbalance
- Decide what you need/want to know
- Assess gaps in data available
- Choose the best method(s) to get the data you need/want
- Explain options to the client
- Answer questions and help them determine their best option
- Schedule future appointments

Follow up

- Initial nutritional follow up - 2-6 weeks
  - 2-3 weeks, phone or in-house – Q & A
  - 3-6 weeks
    - Repeat testing
    - Progress report
    - Make adjustments to recommendations
      - Dietary, supplements, lifestyle, bodywork
    - Suggest additional testing PRN
    - Design plan and answer questions
- Follow up every 4-12 weeks until goals met

Creating an Environment for Change

- Provide a supplement schedule & summary of key recommendations

Remedy/Supplement	Upon rising	Breakfast	Mid – morning	Lunch	Mid – afternoon	Dinner	Before retiring
Enzefen – in 4-6 oz liquid, then 12 oz water	1 Tbsp				1 Tbsp		
UltraClear Plus pH – as directed							
AdvaClear – as directed							
Ultra Potent C – 1 heaping tsp in each serving UltraClear Plus pH							
Phyto-Multi		1				1	
Multi-Min Chelate		2				2	
Nutri-DM/SA – 2 caps b4 bed for 1 month, then 3 caps before bed for 2 months, then 4 caps before bed for 1 month							2-4

- Dry skin brushing – 1-2x daily
- CHEW your food at LEAST 30 times (it should be liquid☺) before swallowing
- Water – drink 2.5 quarts of water/tea daily in divided doses (4 oz. (1/2 cup) every 30 minutes optimal)
- Green or Rooibos tea – 5 cups daily

Creating an Environment for Change

- Give an explanation sheet for any testing
  - Often provided by test supplier
  - Customize for in-house tests
- Put your findings & recommendations in writing and/or allow people to record them
- Provide a checklist for new activities & recommendations

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Daily Checklist for

Day / Date →							
Supplements							
Upon rising							
Breakfast							
Mid-am							
Lunch							
Mid-pm							
Dinner							
Before bed							
Other							
Daily Tasks							
Skin Brushing							
Deep Breathing Exercises							
Hours Sleep							
Minutes Sunshine							
Gratitude Journal							
Meditate/Pray (minutes)							
How do you feel?							
Diet							
Breakfast							
Snack							
Lunch							
Snack							

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Dinner							
Water (oz.)							
Other drinks							
# Vegetables (1 cup/piece)							
# Fruits (1 cup/piece)							
# Protein (deck cards)							
Review Lifestyle Program							
Make/expand goals criteria							
Therapy:							
Footbath							
Alternate Nostril Breathing							
Baths							
Exercise/Stretching							
Aerobic							
Resistance							
Stretching/yoga							
Stand Board							
Classes							
Cooking							
Lifestyle							
Other							

Creating an Environment for Change

- Give an explanation sheet for any testing
  - Often provided by test supplier
  - Customize for in-house tests
- Put your findings & recommendations in writing and/or allow people to record them
- Provide a checklist
- Do a check-in 1-2 weeks after ROF

Questions on How to Structure Consultations??

Finding Answers

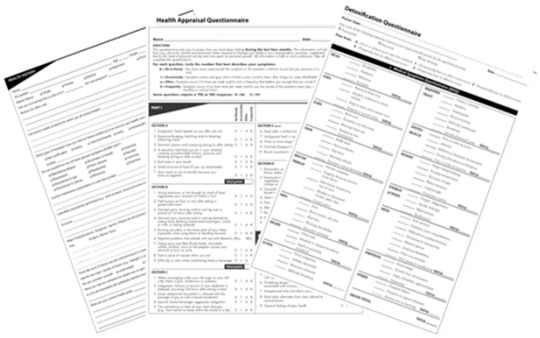
Test, Don't Guess

- Provides an objective measure of progress
- Helps client understand their condition
- Improves quality of care

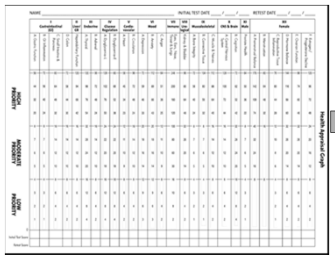
Primary Concern vs. Underlying Cause

- Primary Concern (PC)
  - Presenting with acute symptoms
  - What they are coming in for
  - No explanation necessary
- Underlying Cause
  - May or may not exhibit acute symptoms
  - NEED to correct in order to address PC
  - May be able to discern from interview
  - Usually requires additional testing
  - Will need to explain why it's important to address

Health Appraisal & History



HAQ Graph and NRG



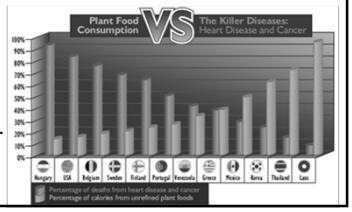
Reassess every 3-6 months to document progress

Using lab tests to create patient focused nutritional strategies

- Biochemical Individuality
  - Everyone's needs are different
  - Everyone expresses nutrient insufficiency in different ways

Using lab tests to create patient focused nutritional strategies

- Nutrition may be the single most influential component of health over time
- Diet/supplementation/exercise may be the best solution for chronic disease:
  - Obesity
  - Diabetes
  - CVD
  - GI disorders, etc….



Using lab tests to create patient focused nutritional strategies

- Nutritional insufficiency/imbalance is a root cause of many modern health conditions.
- How to detect and restore function and health?
- ➢ TESTING!

Testing

- In-house testing
- Lab work
- Functional Tests

In-House Testing

- Vitals
- Physical Exam
- Measurements
- BIA
- Zinc Tally
- Iodine stain
- Urine dip stick

Vitals: Blood Pressure

- Lying/sitting
  - Categories of Blood Pressure for Adults (mmHg)

Category	Systolic (Top number)	Diastolic (Bottom number)
Normal	<120	<80
Pre-hypertension	120-139	80-89
High Blood Pressure	140-159	90-99
Stage 2	>160	>100

Vitals: Blood Pressure

- Orthostatic
  - Take lying blood pressure after prone for 5-10 min
  - Have patient stand; take blood pressure immediately and again 1 minute later

Normal	Systolic should increase 5-10 mmHg	Diastolic should increase 5mmHg
Orthostatic Hypotension	Systolic decreases	Diastolic decreases

  - A drop of more than 5-10 mmHg upon standing is suggestive of adrenal stress/fatigue
  - If BP does not recover at 1 min post-standing test is suggestive of long-term adrenal fatigue

Blood pressure: Case Study

- Lying blood pressure: 120/75
- Standing blood pressure: 125/80

- Next steps?

Blood pressure: Case Study

- Lying blood pressure: 110/75
- Standing blood pressure: 100/65

- Next steps?

Vitals: Body Temperature

Signs and Symptoms	Range
Normal	98.6° F
Non-diagnostic range	97.8 - 99.0° F
Hypothermia	< 96° F
Fever (oral) Fever (rectal)	> 99.5° F > 100.4° F
Axillary basal body temperature	•For tracking ovulation: will see a .4° F increase over 4 days •For tracking sub-laboratory hypothyroidism <97° F

Vitals: Body Temperature – Ovulation and Basal Temperature

All Info About Pregnancy - Basal Body Temperature Chart

Month						Year										Longest Cycle										Shortest Cycle															
Cycle Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
Date																																				
Menses																																				
Intercourse																																				
Cervix																																				
99.0																																				
98.9																																				
98.8																																				
98.7																																				
98.6																																				
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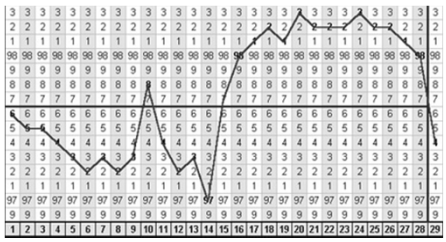
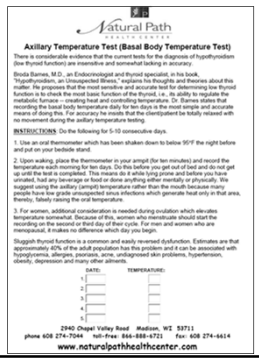
Vitals: Body Temperature – Ovulation and Basal Temperature



Vitals: Body Temperature –Basal Temperature



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Axillary Temperature Test (Basal Body Temperature Test)

There is considerable evidence that the current tests for the diagnosis of hypothyroidism (low thyroid function) are insensitive and somewhat lacking in accuracy.

Broda Barnes, M.D., an Endocrinologist and thyroid specialist, in his book, "Hypothyroidism, an Unsuspected Illness," explains his thoughts and theories about this matter. He proposes that the most sensitive and accurate test for determining low thyroid function is to check the most basic function of the thyroid, i.e., its ability to regulate the metabolic furnace -- creating heat and controlling temperature. Dr. Barnes states that recording the basal body temperature daily for ten days is the most simple and accurate means of doing this. For accuracy he insists that the client/patient be totally relaxed with no movement during the axillary temperature testing.

INSTRUCTIONS: Do the following for 5-10 consecutive days.

1. Use an oral thermometer which has been shaken down to below 95°F the night before and put on your bedside stand.

2. Upon waking, place the thermometer in your armpit (for ten minutes) and record the temperature each morning for ten days. Do this before you get out of bed and do not get up until the test is completed. This means do it while lying prone and before you have urinated, had any beverage or food or done anything either mentally or physically. We suggest using the axillary (armpit) temperature rather than the mouth because many people have low grade unsuspected sinus infections which generate heat only in that area, thereby, falsely raising the oral temperature.

3. For women, additional consideration is needed during ovulation which elevates temperature somewhat. Because of this, women who menstruate should start the recording on the second or third day of their cycle. For men and women who are menopausal, it makes no difference which day you begin.

Sluggish thyroid function is a common and easily reversed dysfunction. Estimates are that approximately 40% of the adult population has this problem and it can be associated with hypoglycemia, allergies, psoriasis, acne, undiagnosed skin problems, hypertension, obesity, depression and many other ailments.

DATE: TEMPERATURE:

1 ____ ____
2 ____ ____
3 ____ ____
4 ____ ____
5 ____ ____

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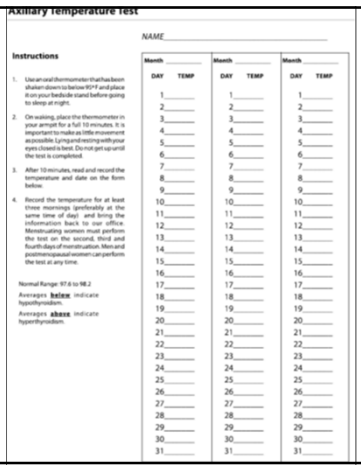

Axillary Temperature Test

NAME _____

Instructions

1. Use an oral thermometer that has been shaken down to below 95°F and place it on your bedside stand before going to sleep at night.
2. On waking, place the thermometer in your armpit for a full 10 minutes. It is important to make as little movement as possible. Lying and resting with your eyes closed is best. Do not get up until the test is completed.
3. After 10 minutes, read and record the temperature and date on the form below.
4. Record the temperature for at least three mornings (preferably at the same time of day) and bring the information back to our office. Menstruating women must perform the test on the second, third and fourth days of menstruation. Men and postmenopausal women can perform the test at any time.

Normal Range: 97.6 to 98.2

Averages **below** indicate hypothyroidism.

Averages **above** indicate hyperthyroidism.

Month ____		Month ____		Month ____	
DAY	TEMP	DAY	TEMP	DAY	TEMP
1		1		1	
2		2		2	
3		3		3	
4		4		4	
5		5		5	
6		6		6	
7		7		7	
8		8		8	
9		9		9	
10		10		10	
11		11		11	
12		12		12	
13		13		13	
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23		23		23	
24		24		24	
25		25		25	
26		26		26	
27		27		27	
28		28		28	
29		29		29	
30		30		30	
31		31		31	

Vitals: Pulse

Age	Location	Rate
Adults (12+)	radial or carotid	Normal = 72 bpm Tachycardia = >100 bpm Bradycardia = <60 bpm
Kids	radial or carotid	60-100 bpm
Infant	brachial	100-160 bpm

Vitals: Respiratory Rate

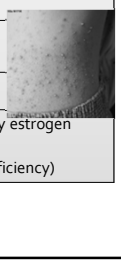
Adults	Normal = 12-20 breaths per minute Tachypnea = >20 breaths per minute
Kids (5 yrs)	Normal = 20-30 breaths per minute
Infants Toddler (2 yr)	Normal = 30-50 breaths per minute Normal = 25-32

Physical Exam: Head

Signs and Symptoms	Possible Causes/Deficiency
Dry hair	•Hypothyroidism •EFA deficiency/imbalance •Chemical sensitivity
Itchy/dandruff	•Hypothyroidism, eczema, psoriasis (gut) •Toxicity (parasites, heavy metal, liver function) •Immune system (allergies, CA) •EFA deficiency
Premature graying	•Cellular energy and/or mineral imbalance
Hair loss/falls out easily	•Hypothyroid, adrenal fatigue •Toxicity (parasites, heavy metals, liver function) •EFA deficiency/imbalance

Physical Exam: Skin

Signs and Symptoms	Possible Causes/Deficiency
Dry	•Dehydrated •Hypothyroid •EFA deficiency
Follicular Hyperkeratosis	•Blood sugar dysregulation •Vitamin A deficiency
Skin Tag	•Blood sugar imbalance
Pigmentation (hyper/hypo) – melasma, vitiligo	•Endocrine system specifically estrogen dominance •Auto-immune (vitamin D deficiency)



Physical Exam: Skin (con't)

Signs and Symptoms	Possible Causes/Deficiency
Itching	•Toxicity (parasites, heavy metals, liver function) •Immune system (allergy, CA) •EFA deficiency/imbalance
Color	•Red (inflammation, irritation, immune/allergy response, hormone imbalance) •Pallor (anemia, hypothyroidism, poor circulation – blue) •Easy bruising (vitamin C, K deficiency) •Medication overdose (aspirin, NSAIDs, Warfarin) •Slow wound healing (protein deficiency, Zn, EFA)
Turgor	•Dehydration

Physical Exam: Skin (con't)

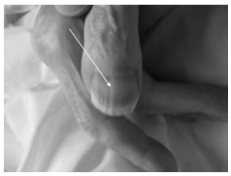
Signs and Symptoms	Possible Causes/Deficiency
Seborrheic dermatitis (forehead shiny and scaly, with yellow greasy look extending into eyebrows, down nose, cheeks, chest)	•GI Imbalance
Acne, Acne Rosacea	•GI Imbalance •Endocrine system imbalance •EFA imbalance •Vitamin A deficiency

Physical Exam: Fingernails

Signs and Symptoms	Possible Causes/Deficiency
Lengthwise grooves/ridges	•Iron, folic acid and/or protein deficiency, Kidney disorder
Brittle	•Iron deficiency, thyroid, impaired kidney function, EFA deficiency
Chip, peel, crack, break easily	•Insufficient HCl, protein and/or mineral deficiency
Clubbed	•Pulmonary and/or cardiovascular causes (80%)
White spots	•Zinc deficiency
White lines	•Selenium deficiency, Heart disease, Heavy metal toxicity

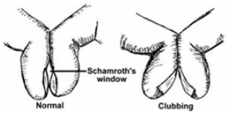
Physical Exam: Fingernails

Signs and Symptoms	Possible Causes/Deficiency
Lengthwise grooves/ridges	•Iron, folic acid and/or protein deficiency, Kidney disorder



Physical Exam: Fingernails

Signs and Symptoms	Possible Causes/Deficiency
Clubbed	•Pulmonary and/or cardiovascular causes (80%)



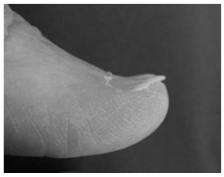
Physical Exam: Fingernails

Signs and Symptoms	Possible Causes/Deficiency
White Spots	•Zinc deficiency

Physical Exam: Fingernails

Signs and Symptoms	Possible Causes/Deficiency
Concave nails (spoon shaped); usually thin	•Iron, B12 and/or protein deficiency; HCL deficiency; diabetes; detoxification imbalance

Spoon nail



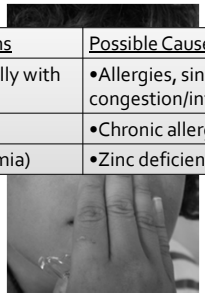
Physical Exam: Eyes

Signs and Symptoms	Possible Causes/Deficiency
Lateral third thinning eyebrow	•Hypothyroid
Dark circles under eyes	•Food allergies, blood sugar and/or kidney imbalance
Pupillary light reflex	•Optic nerve damage, concussion, brain lesion •Adrenal fatigue
Dull, conjunctiva	•Vitamin A
Pallor lower lid	•Anemia
Exophthalmos (protruding eyes)	•Hyperthyroidism

Physical Exam: Ears

Signs and Symptoms	Possible Causes/Deficiency
Painful (kids pulling on ears)	•Otitis externa or media
Discharge	•Infections
Hearing difficulties	•Cerumen (wax)
Tinnitus (ringing in ears)	•Blood sugar imbalance, blood pressure, adrenal stress, heavy metal toxicity (lead/aluminum), hyperlipidemia, food sensitivity (esp salicylates)

Physical Exam: Nose



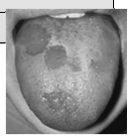
Signs and Symptoms	Possible Causes/Deficiency
Salute sign (especially with watery/puffy eyes)	•Allergies, sinus congestion/infection
Intra nasal polyps	•Chronic allergies
Loss of smell (anosmia)	•Zinc deficiency

Physical Exam: Mouth

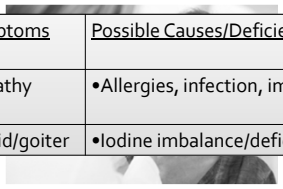
Signs and Symptoms	Possible Causes/Deficiency
Teeth	•Poor quality diet, lack of oral hygiene •Fillings (sugar, oral hydgiene, thyroid, CNS) •Decay (mineral deficiency, intake/absorption)
Bleeding gums	•Vitamin C, bioflavonoids
Canker sore (Aphthous ulcers)	•Allergies, sugar, citrus, coffee, medications
Cracked lips (Cheilosis or angular stomatitis)	•Riboflavin (B2), B-complex, iron, protein
Cold sores	•Immune system •Lysine, Zinc
Inside cheeks (Buccal Mucosa)	•Candida (thrush), Lichen Planus

Physical Exam: Tongue

Signs and Symptoms	Possible Causes/Deficiency
Fissuring, raw	•Thiamin (B1)
Glossitis	•Pyridoxine (B6), folic acid, iron, Cobalamin (B12)
Pale	•Iron, Cobalamin (B12)
Geographic	•Allergies, B vitamins



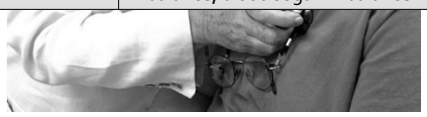
Physical Exam: Neck



Signs and Symptoms	Possible Causes/Deficiency
Lymphadenopathy	•Allergies, infection, immune function
Enlarged thyroid/goiter	•Iodine imbalance/deficiency

Physical Exam: Heart

Signs and Symptoms	Possible Causes/Deficiency
Tachycardia/ cardiac arrhythmias	•Magnesium, potassium, calcium, thiamin (B1) •Hyperthyroid, low progesterone, stress/panic attacks, neurotransmitter imbalance, blood sugar imbalance



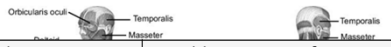
Physical Exam: Abdomen

Signs and Symptoms	Possible Causes/Deficiency
Central obesity	•Blood sugar imbalance, hormone imbalance
Excessive bloating	•Dysbiosis •Poor digestion (Digestive enzyme and/or HCl deficiency) •Fatty liver, gallbladder
Pain on palpation	•Inflammation (diverticulitis, colitis…) •Constipation

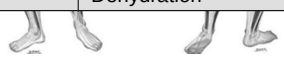
Physical Exam: Joints

Signs and Symptoms	Possible Causes/Deficiency
Osteoarthritis	•Calcium, magnesium, glucosamine, chondroitin
Rheumatoid Arthritis	•Auto-immunity •Bioflavonoids, glucosamine, chondroitin , Vitamin D, EFA
Pain	•Inflammation, Vitamin D

Physical Exam: Muscles

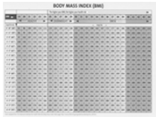


Signs and Symptoms	Possible Causes/Deficiency
Wasting	•Protein deficiency/malabsorption •Adrenal stress •Inflammation •Hormone/Vitamin D imbalance
Cramping, twitching, pains	•Potassium, magnesium, calcium •Dehydration



Physical Exam: Body Composition

- BMI
- Measurements
- Calipers
- Bioelectrical Impedance Analysis (BIA)



BODY MASS INDEX (BMI)

The higher your BMI, the higher your health risk

BMI	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
	HEALTHY							OVERWEIGHT											OBESE							
Height (ft/in) ↓ / Weight (lbs) →																										
4' 10" (58")	91	96	100	105	110	115	119	124	129	134	138	143	148	153	158	162	167	172	177	181	186	191	196	201	205	210
4' 11" (59")	96	99	104	109	114	119	124	128	133	138	143	148	153	158	163	168	173	178	183	188	193	198	203	208	212	217
5' 0" (60")	97	102	107	112	118	123	128	133	138	143	148	153	158	163	168	174	179	184	189	194	199	204	209	215	220	225
5' 1" (61")	100	106	111	116	122	127	132	137	143	148	153	158	164	169	174	180	185	190	195	201	216	211	217	222	227	232
5' 2" (62")	104	109	115	120	126	131	136	142	147	153	158	164	169	175	180	186	191	196	202	207	213	218	224	229	235	240
5' 3" (63")	107	113	118	124	130	135	141	146	152	158	163	169	175	180	186	191	197	203	208	214	220	225	231	237	242	248
5' 4" (64")	110	116	122	128	134	140	145	151	157	163	169	174	180	186	192	197	204	209	215	221	227	232	238	244	250	256
5' 5" (65")	114	120	126	132	138	144	150	156	162	169	174	180	186	192	198	204	210	216	222	228	234	240	246	252	258	264
5' 6" (66")	118	124	130	136	142	148	155	161	167	173	179	186	192	198	204	210	216	223	229	235	241	247	253	260	266	272
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	166	172	178	185	191	198	204	211	217	223	230	236	242	249	255	261	268	274	280
5' 8" (68")	125	131	138	144	151	158	164	171	177	184	190	197	203	210	216	223	230	236	243	249	256	262	269	276	282	289
5' 9" (69")	128	135	142	149	155	162	169	176	182	189	196	203	209	216	223	230	236	243	250	257	263	270	277	284	291	297
5' 10" (70")	132	139	146	153	160	167	174	181	188	195	202	209	216	222	229	236	243	250	257	264	271	278	285	292	299	306
5' 11" (71")	136	143	150	157	165	172	179	186	193	200	208	215	222	229	236	243	250	257	265	272	279	286	293	301	308	315
6' 0" (72")	140	147	154	162	169	177	184	191	199	206	213	221	228	235	242	250	258	265	272	279	287	294	302	309	316	324
6' 1" (73")	144	151	159	166	174	182	189	197	204	212	219	227	235													
6' 2" (74")	148	155	163	171	179	186	194	202	210	218	225	233	241													
6' 3" (75")	152	160	168	176	184	192	200	208	216	224	232	240	248													
6' 4" (76")	156	164	172	180	189	197	205	213	221	230	238	246	254	263	271	279	287	295	304	312	320	328	336	344	353	361

Weight (lbs) ÷ height (inches) ÷ height (inches) x 703

Chart adapted from The National Institutes for Health Web site, Body Mass Index Table page http://www.nhlbi.nih.gov/guidelines/obesity/bmi_tbl.htm.

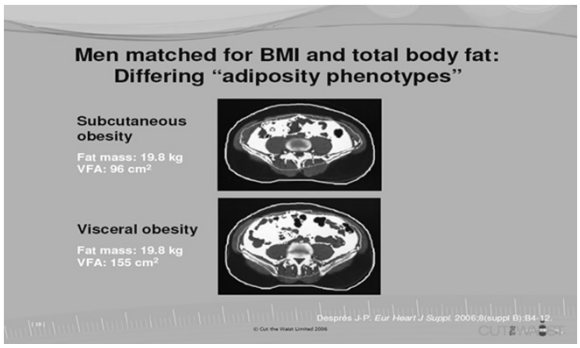
BMI

- Pros
  - Quick and easy
  - Useful to identify and track population trends in weight

- Cons
  - Does not take into account muscle mass
    - Athletes, body builders, "fat skinny person"
  - Does not take into account distribution of body fat

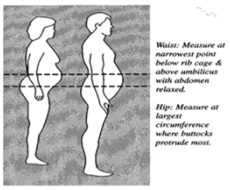
Ekroyan G. Adolphe Quetelet (1796-1874) - the average man and indices of obesity. *Nephrol Dial Transplant* 2008; **23**: 47-51.
Chan DC, Watts GF, Barrett PHR, Burke V. Waist circumference, waist-to-hip ratio and body mass index as predictors of adipose tissue compartments in men. *Q Med* 2003; **96**: 441-447

BMI Limitations



Physical Exam: Measurements

Waist Circumference & Waist-to-Hip Ratio (WHR)



Waist: Measure at narrowest point below rib cage & above umbilicus with abdomen relaxed.

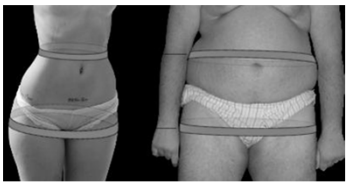
Hip: Measure at largest circumference where buttocks protrude most.

Measuring Tape Position for Waist and Hip Circumference in Adults

Central Adiposity

	Waist Circumference	*WHR**
Women	> 35 inches	> 0.8
Men	> 40 inches	> 1.0

**(WHR= Waist Circumference (in.)/Hip Circumference (in.)*



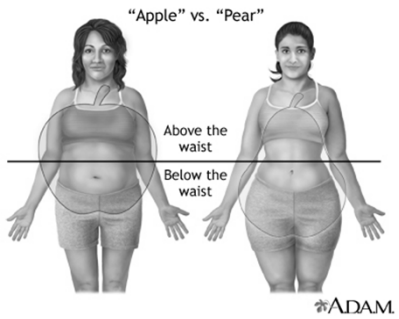
Physical Exam: Measurements

Waist to Hip Circumference Ratio Standards for Men and Women

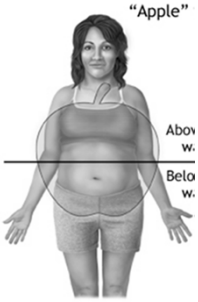
	Age (years)	Disease Risk Related to Obesity: Low	Moderate	High	Very High
MEN	20-29	<0.83	0.83-0.88	0.89-0.94	>0.94
	30-39	<0.84	0.84-0.91	0.92-0.96	>0.96
	40-49	<0.88	0.88-0.95	0.96-1.00	>1.00
	50-59	<0.90	0.90-0.96	0.97-1.02	>1.02
	60-69	<0.91	0.91-0.98	0.99-1.03	>1.03
WOMEN	20-29	<0.71	0.71-0.77	0.78-0.82	>0.82
	30-39	<0.72	0.72-0.78	0.79-0.84	>0.84
	40-49	<0.73	0.73-0.79	0.80-0.87	>0.87
	50-59	<0.74	0.74-0.81	0.82-0.88	>0.88
	60-69	<0.76	0.76-0.83	0.84-0.90	>0.90

(Adapted from Heyward VH, Stolarczyk LM: Applied Body Composition Assessment. Champaign IL, Human Kinetics, 1996, p82.)

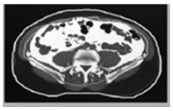
Physical Exam: Measurements



Physical Exam: Measurements



- More visceral fat
- Increased risk for:
  - High blood pressure
  - High cholesterol
  - Heart disease
  - Syndrome X
  - Type II Diabetes



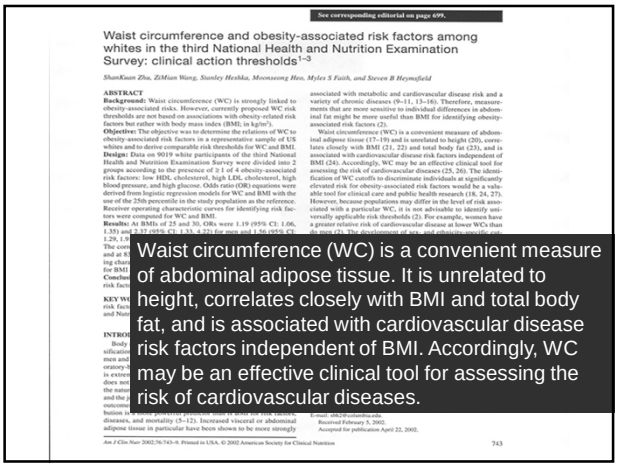
Measurements: Example

- 45 yo female
  - Waist: 38"
  - Hips: 42"
  - WHR: 0.90
- Increased risk for?
  - High blood pressure
  - High cholesterol
  - Heart disease
  - Syndrome X
  - Type II Diabetes

Waist Circumference Predicts Metabolic Risk

- Based on data from epidemiological studies, the Expert Panel on the Identification, Evaluation, and Treatment of Overweight, and Obesity in Adults, convened by the NIH, proposed that men with a waist circumference greater than 102 cm (40 in.) and women with a waist circumference greater than 88 cm (35 in.) are at increased risk for metabolic diseases.

Klein S. The case of visceral fat: argument for the defense. J Clin. Invest. 2004; 113(11): 1530-1532.


See corresponding editorial on page 699.

Waist circumference and obesity-associated risk factors among whites in the third National Health and Nutrition Examination Survey: clinical action thresholds[1–3]

ShanKuan Zhu, ZiMian Wang, Stanley Heshka, Moonseong Heo, Myles S Faith, and Steven B Heymsfield

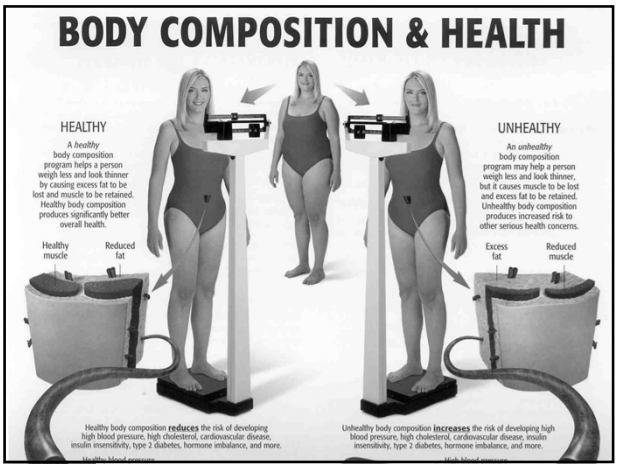
ABSTRACT

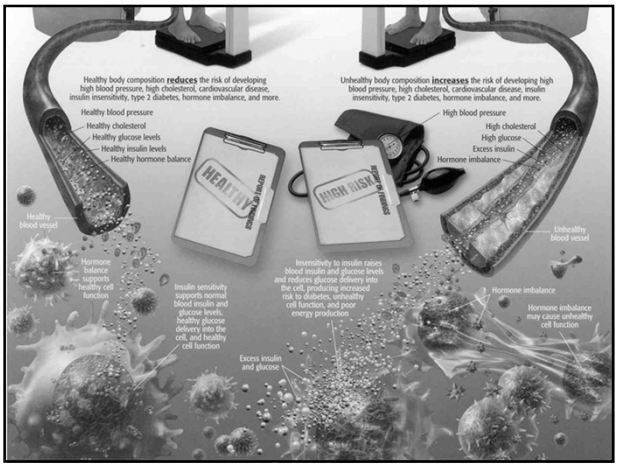
Waist circumference (WC) is a convenient measure of abdominal adipose tissue. It is unrelated to height, correlates closely with BMI and total body fat, and is associated with cardiovascular disease risk factors independent of BMI. Accordingly, WC may be an effective clinical tool for assessing the risk of cardiovascular diseases.

Normal Weight Individuals Can Have High VAT

- Subjects with a relatively low BMI, such as "metabolically obese" normal-weight individuals, can have gross increases in abdominal visceral fat, and others with a high BMI may have very little intra-abdominal (visceral fat).

Wajchenberg BL. Subcutaneous and visceral adipose tissue: their relation to the metabolic syndrome. Endocrine Reviews. 2000;21(6):697-738.





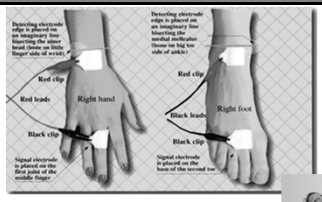
Physical Exam: Calipers

- The more sites, the better
- 7-sites standard
  - Chest, subscapular, tricep, suprailiac crest, abdomen, thigh, calf
- Body fat % is based on an equation using the sum of the skin fold calculations

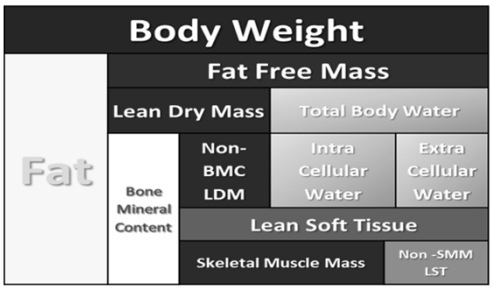
Bioelectrical Impedance Analysis (BIA)

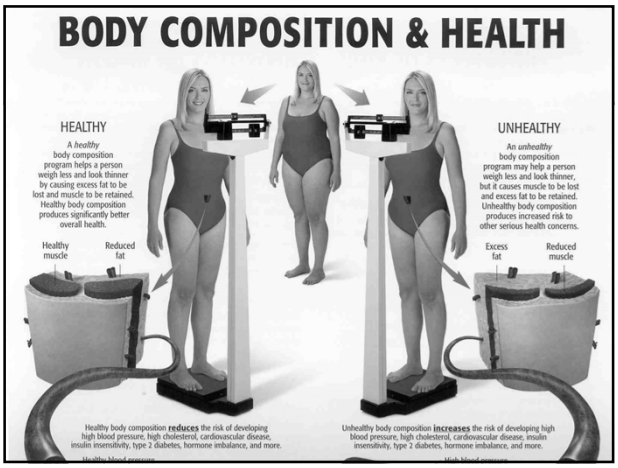
- BIA measures:
  - Body fat
  - Lean muscle mass
  - Total body water
  - Intracellular water
  - Extracellular water
  - Basal metabolic rate
  - Phase angle
  - Daily energy needs

BIA: Electrode Placement



Bioelectrical Impedance Analysis (BIA)





Body Composition

- Risk of disease associated with excess fat
- Weight loss
  - Healthy: Fat ↓, ICW ↑, BCM
  - Long-term or short-term
- BCM/LBM – protein needs
  - 1-1.5 grams protein/lb of BCM
  - Metabolic/Mitochondrial function
  - Exercise – beneficial/enough
  - Best biomarker of healthy aging

Ideal body fat %:

Female = 20-25%

Males = 10-15%

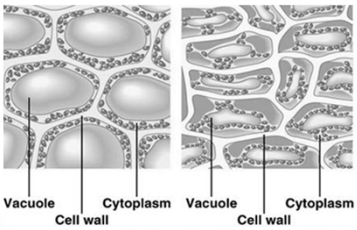
Water Distribution

- TBW low = insufficient water intake
  - Water needs; eliminate diuretics
- ICW low = functionally dehydrated
  - Electrolyte (K/Mg), EFA &/or detoxification need
  - Exercise
- ECW high
  - Hormone imbalance(s), food hypersensitivity, inflammation, kidney impairment, hypertension, sodium imbalance

CAUSES OF FLUID SHIFT

Cause of Fluid Shift	Effect on ICW	Effect on ECW
1. Anabolic processes	↑	↓
2. Improved Nutrient Status	↑	↓
3. Catabolic processes	↓	↑
4. Low potassium	↓	↑
5. Impaired mitochondria	↓	↑
6. Low Magnesium	↓	↑
7. Adrenal stress	↓	↑
8. Kidney dysfunction	↓	↑
9. Low levels of EFA's	↓	↑
10. High levels of trans fats	↓	↑
11. Protein Glycation	↓	↑
12. Inflammation	↓	↑
13. Disease processes	↓	↑
14. Allergy	↓	↑
15. Increased fat mass	↓	↑
16. Other	↓	↑

Hydrated cells vs. Dehydrated cells



Phase Angle

- Overall measure of cellular health
- Improving health: phase angle trends higher
- Failing health: phase angle trends lower
- Best prognostic indicator of survival for patients with cancer, AIDS and renal disease

BIA: Optimal Values

BIA optimal values

	Men			Women		
Age	ICW	TBW	Phase Angle	ICW	TBW	Phase Angle
20	66	60	7.9	61	55	7.3
30	65	60	7.6	60	55	7.0
40	64	60	7.3	59	55	6.7
50	62	60	6.9	57	55	6.3
60	60	60	6.4	55	55	5.8
70	58	60	5.8	53	55	5.2
80	56	60	5.1	51	55	4.5

NOTE: Values based upon measurements utilizing the RJL Systems Inc. Quantum 1000 BIA

BIA Benefits

- Simple, objective, in-office procedure
- Early detection of imbalances
- Reliable progress monitor
- Inexpensive and solid ROI

	4/26/2012	6/7/2012	3/12/2013	4/19/2013	5/11/2013	6/6/2013
Height	71	71	71	71	71	71
Weight	173.2	182.6	187.6	178.6	176.4	175.4
BMR	2032.76	2069.56	2099.38	2054.41	2080.21	2084.31
Fat	14.4217	19.9019	21.7249	17.5156	12.5675	11.1304
Fat % of Weight	8.30%	10.90%	11.60%	9.80%	7.10%	6.30%
SMM	81.583	85.2468	83.2492	82.6184	82.0187	84.0314
TBW	110.522	114.083	116.76	112.605	114.383	114.613
TBW % of Weight	63.80%	62.50%	62.20%	63.00%	64.80%	65.30%
ICW	62.9966	65.0724	65.7811	64.0223	64.4805	64.8856
ICW % of TBW	57.00%	57.00%	56.30%	56.90%	56.40%	56.60%
ECW	47.5256	49.0102	50.9791	48.5827	49.9021	49.7273
ECW % of TBW	43.00%	43.00%	43.70%	43.10%	43.60%	43.40%

	12/8/2011	12/29/2011	1/12/2012	1/26/2012	2/9/2012	3/22/2012
Height	71	71	71	71	71	71
Weight	193.2	190.6	186.8	186	186.8	181
BMR	1990.3	2027.8	2006.9	2026.8	2016.1	2023.0
Fat	38.9	32.4	30.8	27.9	29.8	23.3
Fat % of Weight	20.2%	17.0%	16.5%	15.0%	16.0%	12.9%
FFM	154.3	158.2	156.0	158.1	157.0	157.7
SMM	80.6	82.3	81.8	81.1	80.1	81.7
TBW	109.0	111.6	109.7	111.1	110.4	110.4
TBW % of Weight	56.4%	58.5%	58.7%	59.8%	59.1%	61.0%
ICW	62.8	63.9	63.1	63.4	63.0	63.2
ICW % of TWB	57.6%	57.3%	57.5%	57.1%	57.1%	57.2%
ECW	46.2	47.7	46.6	47.7	47.4	47.3
ECW % of TBW	42.4%	42.7%	42.5%	42.9%	42.9%	42.8%

BIA Ordering Information

- Contact: Charles Hughes
- charles@hughesclinical.com
- W- 320-762-4295 / C – 952-210-6394
- Code: OLERSEMINAR
  - Get lowest clinical price on new units
  - Receive free training materials with new units

Zinc Tally

- Quick, effective zinc status assessment
- 2 tsp of Zinc Tally in mouth; swish for 20 sec
  - If no metallic taste/astringency – very deficient
    - Recommend 150 mg/Zn/day
  - Some metallic taste/astringency – deficient
    - Recommend 100 mg/Zn/day
  - Strong metallic taste/astringency – sufficient
    - Recommend no or 25 mg/Zn/day
- Retest in 1 month

Iodine stain

- Quick iodine assessment
- Apply 2% iodine solution to inner forearm
  - About the size of quarter
  - Cover with Band-Aid once dry
- Observe length of time until disappears
  - > 6 hours – sufficient iodine status
  - < 6 hour – indicates need for iodine

Urine Dip Stick

•Appearance, color, odor	•Cloudy, dark, foul smell may indicate infection (bacteria, pus, blood) •Sweet smell may indicate Diabetes
pH	•Assess overall acidity/kidney function •pH>6.8: impaired kidney or UTI
Leukocyte Esterase	•(+): infection or contamination
Nitrite	•(+) with (+) leukocyte: UTI
Protein	•Presence may indicate kidney disease
Glucose	•Presence may indicate diabetes; liver disease, pregnancy
Specific Gravity	•1.005-1.030 – assess hydration, protein, glucose
Ketones	•Presence may indicate insufficient carb intake/utilization; insufficient insulin (diabetes)
Blood (hemoglobin)	•Disease of kidney/urinary tract, contamination
Bilirubin/Urobilinogen	•Liver disease, biliary obstruction, hemolytic anemia

Lab Work

- CBC w/ WBC diff
- Comprehensive metabolic panel
  - Glucose, liver function, kidney function, electrolytes, proteins
- Fasting Lipid Panel
- Thyroid panel (TSH, Free T3, Free T4)
- 25 OH Vitamin D
- GTT/ITT
- HgA1C
- Homocysteine
- Hs-CRP
- Fibrinogen
- SED Rate
- Ferritin/Iron
- Sex hormones/SHBG
- Urinalysis/culture

Lab Work: CBC with WBC Diff

- Red Blood Cells
  - RBC
    - Low: blood loss; hemolytic rxn, bone marrow disorder
    - High: dehydration, polycythemia
  - Hgb/Hct
    - Low: anemia, hemolytic rxn
    - High: polycythemia
  - MCV – classify anemias
    - Low: microcytic – need iron
    - High: macrocytic – need B12/Folate

Test	Result	Unit	Reference Range	
RBC	5.28	M/mm3	4.50	5.40
Hgb	15.6	g/dL	13.2	17.1
Hct	45.7	%	38.5	50.0
MCV	86.5	fL	80.0	100.0
MCH	29.5	Pg	27.0	33.0
MCHC	34.1	g/dL	32.0	36.0

RBC Case Study #1

Test	Result	Unit	Reference Range	
RBC	3.5	M/mm3	4.50	5.40
Hgb	11.6	g/dL	13.2	17.1
Hct	36.0	%	38.5	50.0
MCV	78.2	fL	80.0	100.0
MCH	29.5	Pg	27.0	33.0
MCHC	34.1	g/dL	32.0	36.0

- Next Steps?
  - Look for cause of low RBC
    - Trauma (recent)
    - Internal bleeding
      - GI tract, bladder/uterus
    - Hemolytic reaction
      - Medication(s)
      - Autoimmunity
    - Hemoglobinopathy
      - Sickle cell anemia
    - Chronic inflammatory condition/disease
  - Support RBC formation
    - Iron, succinic acid, glycine, folic acid, B6, B12

RBC Case Study #2

Test	Result	Unit	Reference Range	
RBC	4.62	M/mm3	4.50	5.40
Hgb	11.6	g/dL	13.2	17.1
Hct	36.0	%	38.5	50.0
MCV	104.2	fL	80.0	100.0
MCH	29.5	Pg	27.0	33.0
MCHC	34.1	g/dL	32.0	36.0

- Next Steps?
  - Supplement
    - Iron
    - Folate
    - B12

Lab Work: CBC with WBC Diff

- White Blood Cell Differential
  - WBC
    - Critical levels <2500 or >30,000
    - >10K: active infection, inflammation (acute)
    - <4K: viral/chronic infection, bone marrow disorder
  - Differential Counts

Test	Result	Unit	Reference Range	
WBC	6.1	K/mm3	4.5	13
LY	27.7	%	25.0	45.0
MO	4.8	%	3.0	6.0
EO	2.5	%	0.0	3.0
BA	1.0	%	0.0	1.0
LY#	1.6	K/mm3	1.5	5.8
MO#	0.4	K/mm3	0.1	0.8
GR#	4.5	K/mm3	1.8	9.7
EO#	0.2	K/mm3	0.0	0.4
BA#	0.1	K/mm3	0.0	0.1

Lab Work: CBC with WBC Diff

- Neutrophils
  - High: acute bacterial infection, inflammation
  - Low: viral/overwhelming infection, drug reaction
- Eosinophils
  - High: allergic rxn, parasite, IBD
- Monocytes
  - High: acute/resolving immune response; IBD
- Lymphocytes
  - High: acute viral infection, lymphoma/leukemia
- Basophils
  - High: Inflammation, allergic rxn

Test	Result	Unit	Reference Range	
WBC	6.1	K/mm3	4.5	13
NE	58.0	%	54.0	62.0
LY	27.7	%	25.0	45.0
MO	4.8	%	3.0	6.0
EO	2.5	%	0.0	3.0
BA	1.0	%	0.0	1.0
LY#	1.6	K/mm3	1.5	5.8
MO#	0.4	K/mm3	0.1	0.8
NE#	4.5	K/mm3	1.8	9.7
EO#	0.2	K/mm3	0.0	0.4
BA#	0.1	K/mm3	0.0	0.1

WBC Case Study #1

Test	Result	Unit	Reference Range	
WBC	3.2	K/mm3	4.5	13
NE	42.0	%	54.0	62.0
LY	52.0	%	25.0	45.0
MO	6.0	%	3.0	6.0
EO	0.2	%	0.0	3.0
BA	0.1	%	0.0	1.0

- Analysis?
  - Viral infection, possibly chronic
- Next Steps?
  - Health history – recent and past
  - Additional testing
    - EBV, CMV, etc.

WBC Case Study #2

Test	Result	Unit	Reference Range	
WBC	10.0	K/mm3	4.5	13
NE	54.0	%	54.0	62.0
LY	28.0	%	25.0	45.0
MO	6.0	%	3.0	6.0
EO	8.6	%	0.0	3.0
BA	0.1	%	0.0	1.0

- Analysis?
  - Allergic reaction
- Next steps?
  - Health history
    - Asthma, hay fever, seasonal allergies, known allergies/exposure
  - Testing
    - Food allergy testing
      - IgE and hypersensitivity
    - Environmental allergy testing

CBC with WBC differential: Therapeutic Considerations

- Fatigue
- Chronic infection/illness
  - Guidance on type of infection
- Pallor/pale skin
- Suspect iron, B12 and/or folate deficiency
- Chronic inflammation

Lab Work: Metabolic Panel

- Fasting glucose
  - Optimal: 80-90 mg/dL
  - High: (pre)diabetes
  - Low: hypoglycemia
- BUN
  - Low: malnutrition, malabsorption
- Creatinine & BUN
  - High: impaired kidney fxn

		Ref
Glucose	95	65–100 mg/dL
BUN	15	8–25 mg/dL
Creatinine	1.1	0.8–1.4 mg/dL
Calculated BUN/creat	14	6–28
Sodium	140	133–146 mEq/L
Potassium	4.4	3.5–5.3 mEq/L
Chloride	104	97–110 mEq/L
Carbon dioxide	22	18–30 mEq/L
Calcium	10	8.5–10.5 mg/dL
Protein, total	7.6	6.0–8.4 g/dL
Albumin	4.7	2.9–5.0 g/dL
Calculated globulin	2.9	2.0–3.8 g/dL
Calculated A/G ratio	1.6	0.9–2.5
Bilirubin, total	0.4	0.1–1.3 mg/dL
Alkaline phosphatase	103	30–132 U/L
AST	10	5–35 U/L
ALT	24	17–56 U/L

Lab Work: CMP - Electrolytes

- Calcium
  - High: hyperparathyroid/thyroid, cancer, excess vitamin D
  - Low: malabsorption, vitamin D deficiency
- Chloride
  - High: dehydration, hyperparathyroid
  - Low: severe vomiting, diuretic medications
- Magnesium
  - High: dehydration, kidney disorder
  - Low: chronic diarrhea/sweating, malabsorption, liver disease
- Potassium
  - High: dehydration, cell damage, Addison's disease
  - Low: diarrhea/vomiting/sweating, malabsorption, malnutrition, diuretic, excess licorice ingestion
- Sodium
  - High: dehydration, Cushing's disease
  - Low: diarrhea/vomiting/sweating, malabsorption, diuretics, excess body water

		Ref
Glucose	95	65–100 mg/dL
BUN	15	8–25 mg/dL
Creatinine	1.1	0.8–1.4 mg/dL
Calculated BUN/creat	14	6–28
Sodium	140	133–146 mEq/L
Potassium	4.4	3.5–5.3 mEq/L
Chloride	104	97–110 mEq/L
Carbon dioxide	22	18–30 mEq/L
Calcium	10	8.5–10.5 mg/dL
Protein, total	7.6	6.0–8.4 g/dL
Albumin	4.7	2.9–5.0 g/dL
Calculated globulin	2.9	2.0–3.8 g/dL
Calculated A/G ratio	1.6	0.9–2.5
Bilirubin, total	0.4	0.1–1.3 mg/dL
Alkaline phosphatase	103	30–132 U/L
AST	10	5–35 U/L
ALT	24	17–56 U/L

Lab Work: CMP

- Protein/Albumin
  - High: dehydration, vomiting, diarrhea, poor kidney fxn
  - Low: malabsorption, malnutrition, severe liver disease, alcoholism
- Alk Phos
  - High: obstructive jaundice, cirrhosis, hepatitis; osteomalacia, bone disease, celiac
  - Low: malnutrition
- AST/ALT
  - High: myocardial infarction, liver disease, pancreatitis

		Ref
Glucose	95	65–100 mg/dL
BUN	15	8–25 mg/dL
Creatinine	1.1	0.8–1.4 mg/dL
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CMP: Therapeutic Considerations

- Blood sugar imbalance
- Kidney function
- Liver function
  - Drug effects
- Electrolyte balance
- Parathyroid imbalance
- Severe dehydration

Fasting Lipid Panel

Component	Your result	Standard range	Units
CHOLESTEROL	126	<200	mg/dL
TRIGLYCERIDE	79	<150	mg/dL
HDL	43	>/=40	mg/dL
LDL CALCULATED	67	<100	mg/dL
CHOLESTEROL/HDL	2.9	<5.0	

LIPID PROFILE

	DESIRABLE	BORDERLINE	HIGH RISK
Cholesterol	<200 mg/dl	200-239 mg/dl	240 mg/dl
Triglycerides	<150 mg/dl	150-199 mg/dl	200-499 mg/dl
HDL cholesterol	60 mg/dl	35-45 mg/dl	<35 mg/dl
LDL cholesterol	60-130 mg/dl	130-159 mg/dl	160-189 mg/dl
Cholesterol/ HDL ratio	4.0	5.0	6.0

- TC = VLDL + LDL + HDL
- Friedewald Equation: VLDL = TG/5
- Calculated LDL = TC – (HDL + TG/5)

Fasting Lipid Panel

- Triglycerides
  - A form of fat in blood
  - From diet or made in body from other energy sources
  - When high, deposited in adipose tissue
  - When insulin levels are high, triglyceride metabolism is impaired
  - ➢ Elevated trigs are associated with insulin resistance
  - ➢ Lower sugar, saturated/trans fat and alcohol
- Cholesterol
  - Required for all sex hormone production, cellular membranes and to modulate inflammation
  - Also a component of atherosclerotic plaque
  - LDL – low density
    - "Bad": < 130 mg/dL
  - HDL – high density
    - "Good": > 40 mg/dL
  - Ration Chol:HDL
    - < 4:1 to lower risk of CVD

Cholesterol Facts

- Cholesterol is a part of every cell membrane
- Cholesterol is a precursor of:
  - Steroid hormones (Estrogens, progesterone, testosterone, cortisol)
  - Bile acids (fat digestion)
  - Vitamin D
- Eating cholesterol has very little impact on cholesterol levels in the body
- Cholesterol problematic when
  - Oxidized
  - LDL small, dense and/or high particle number

Simple Test for Insulin Resistance

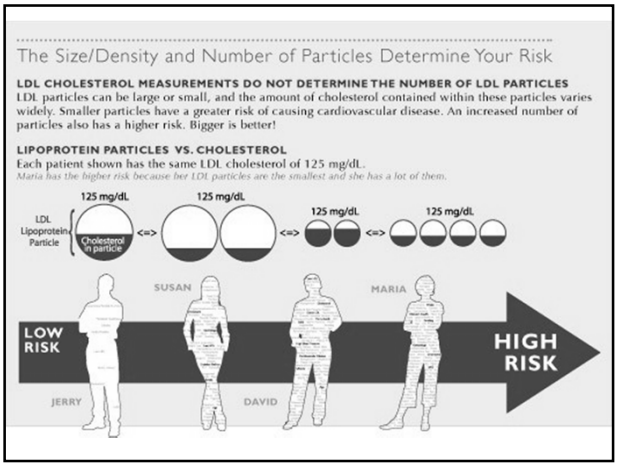
- Insulin resistance is a key component of metabolic syndrome and is very common in overweight/obese people

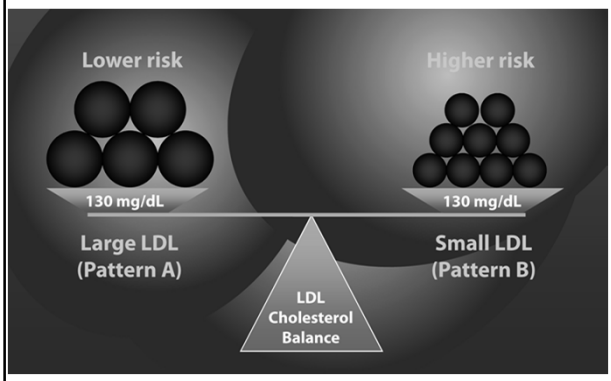
TG/HDL Ratio	
≤ 3.0	Normal
≈ 5.0	Suggestive of insulin resistance
≥ 8.0	Diagnostic of insulin resistance

Ann Int. Med. Nov. 18, 2003. 139(10), p.802-9

Assessing CV Risk

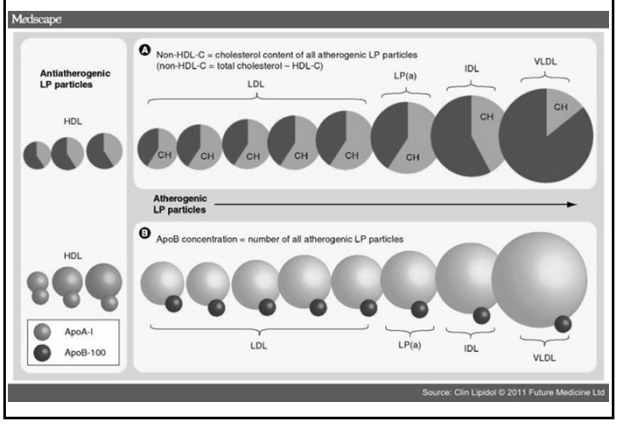
- Standard Cholesterol Panel does NOT provide accurate assessment
- VAP or NMR better
- LPP+ provides best assessment





Risk Factors for CVD

- High Total cholesterol
- High LDL
- Low HDL (Male: < 40 mg/dl; Female: <50 mg/dl)
- High triglycerides (> 150 mg/dl)
- Small, dense LDL (LDL III, LDL IV)
- High Lp(a) (> 30)
- Elevated RLP (Remnant Lipoprotein) (> 150 nmol/L)
- Low HDL2b
- Metabolic syndrome traits (↑ TG, ↓ HDL, ↑ LDLI II, LDL IV)
- High Apo-B-100 (measure of all non-HDL particles)
- High hs-C-Reactive Protein (> 3 mg/L)
- Elevated Insulin (fasting)
- Elevated Homocysteine (> 15 mmol/L)
- High Non-HDL Particle Number and/or high ApoB



VAP Results

Tests Requested VAP Cholesterol Profile

TESTS	RESULT	FLAG	UNITS	REFERENCE INTERVAL	LAB
LDL Cholesterol	**279**	**HIGH**	mg/dL	<130	01
HDL Cholesterol	72		mg/dL	>=40	01
VLDL Cholesterol	17		mg/dL	<30	01
Cholesterol, Total	**367**	**HIGH**	mg/dL	<200	01
Triglycerides	87		mg/dL	<150	01
Non HDL Chol. (LDL+VLDL)	**296**	**HIGH**	mg/dL	<160	01
apoB100-calc	**179**	**HIGH**	mg/dL	<109	01
LDL-R (Real)-C	**252**	**HIGH**	mg/dL	<100	01
Lp(a) Cholesterol	**10.0**	**HIGH**	mg/dL	<10	01
IDL Cholesterol	17		mg/dL	<20	01
Remnant Lipo. (IDL+VLDL3)	26		mg/dL	<30	01
Probable Metabolic Syndrome	No			No	01
HDL-2 (Most Protective)	22		mg/dL	>10	01
HDL-3 (Less Protective)	49		mg/dL	>30	01
VLDL-3 (Small Remnant)	9		mg/dL	<10	01
LDL1 Pattern A	41.7		mg/dL		01
LDL2 Pattern A	107.0		mg/dL		01
LDL3 Pattern B	102.2		mg/dL		01
LDL4 Pattern B	1.5		mg/dL		01
LDL Density Pattern	A			A	01

Pattern B — Pattern — Pattern A
Small, Dense LDL — A/B — Large Buoyant LDL

NMR Results

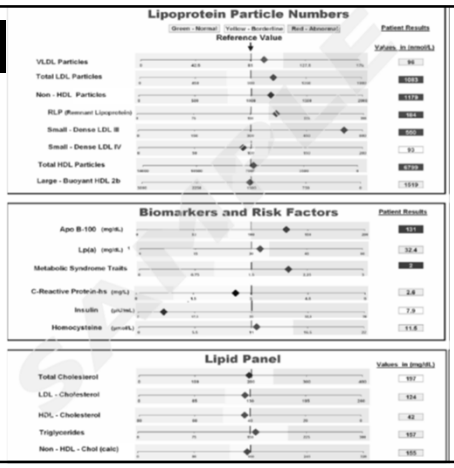
Laboratory Test		Notes	High Risk	Intermediate Risk	Optimal	High Risk Range	Intermediate Risk Range	Optimal Range	Previous Results
Lipids	Total Cholesterol (mg/dL)				143	≥ 240	200 - 239	< 200	
	LDL-C Direct (mg/dL)				76	≥ 130 CHD & CHD risk eq. > 100	100 - 129 CHD & CHD risk eq. 70 - 100	< 100 CHD & CHD risk eq. < 70	
	HDL-C (mg/dL)				48	< 40		≥ 40	
	Triglycerides (mg/dL)				81	> 199	150 - 199	< 150	
	Non-HDL-C (mg/dL) (calculated)				95	≥ 160	130 - 159	< 130	
Lipoprotein Particles and Apolipoproteins	Apo B (mg/dL)			71		≥ 80	60 - 79	< 60	
	LDL-P (nmol/L)		1306			≥ 1300	1000 - 1299	< 1000	
	sdLDL (mg/dL)*					> 30	21 - 30	< 21	
	% sdLDL (calculated)					> 30	26 - 30	< 26	
	Apo A-I (mg/dL)				136	< 114	114 - 131	> 131	
	HDL-P (µmol/L)			31.4		< 28.0	28.0 - 34.0	≥ 35.0	
	HDL2 (mg/dL)*					≤ 8	9 - 11	≥ 12	
	Apo B:Apo A-I Ratio (calculated)				0.52	≥ 0.81	0.61 - 0.81	≤ 0.6	
	Lp(a) Mass (mg/dL)		55			≥ 30		< 30	
	Lp(a) Cholesterol (mg/dL)		7			≥ 6	3 - 5	< 3	

NMR Results

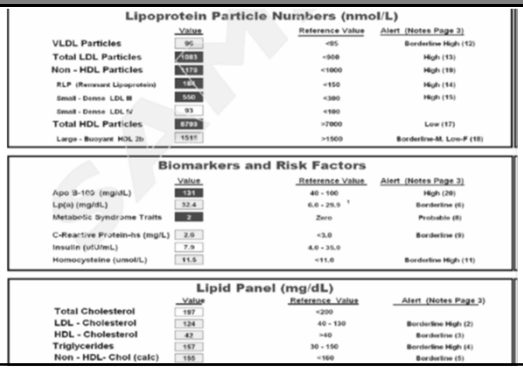
Particle Concentration and Size

	Laboratory Test	Result	Percentile in Reference Population[2] (Higher CVD Risk — Lower CVD Risk)
HDL Particles	HDL-P (total) µmol/L	31.4	low; 25th (20.7); 50th (30.5); 75th (34.9); high; 31.4
	Small LDL-P and LDL Size are associated with CVD risk, but not after LDL-P is taken into account.		(Insulin Resistance — Insulin Sensitive)
Lipoprotein Markers Associated with Insulin Resistance and Diabetes Risk[3]	LARGE VLDL-P nmol/L	< 0.7	high; 75th (6.9); 50th (2.7); 25th (0.9); low; 0.7
	SMALL LDL-P nmol/L	695	high; 75th (839); 50th (527); 25th (117); low; 695
	LARGE HDL-P µmol/L	4.3	low; 25th (3.1); 50th (4.8); 75th (7.3); high; 4.3
	VLDL SIZE nm	51.9	large; 75th (52.5); 50th (46.6); 25th (42.4); small; 51.9
	LDL SIZE nm	20.8	small; 25th (20.4); 50th (20.8); 75th (21.2); large; 20.8
	HDL SIZE nm	8.7	small; 25th (8.9); 50th (9.2); 75th (9.6); large; 8.7
	LP-IR SCORE* 0 - 100	49	insulin resistant; 75th (63); 50th (45); 25th (27); insulin sensitive; 49

LPP+



LPP+



Lipoprotein Particle Numbers (nmol/L)

	Value	Reference Value	Alert (Notes Page 3)
VLDL Particles	95	<85	Borderline High (12)
Total LDL Particles	1081	<900	High (13)
Non - HDL Particles	1170	<1000	High (19)
RLP (Remnant Lipoprotein)	18	<150	High (14)
Small - Dense LDL III	550	<300	High (15)
Small - Dense LDL IV	93	<100	
Total HDL Particles	6799	>7000	Low (17)
Large - Buoyant HDL 2b	1519	>1500	Borderline-M, Low-F (18)

Biomarkers and Risk Factors

	Value	Reference Value	Alert (Notes Page 3)
Apo B-100 (mg/dL)	131	40 - 100	High (20)
Lp(a) (mg/dL)	32.4	6.0 - 29.9 *	Borderline (6)
Metabolic Syndrome Traits	2	Zero	Probable (8)
C-Reactive Protein-hs (mg/L)	2.0	<3.0	Borderline (9)
Insulin (uU/mL)	7.9	4.0 - 35.0	
Homocysteine (umol/L)	11.5	<11.0	Borderline High (11)

Lipid Panel (mg/dL)

	Value	Reference Value	Alert (Notes Page 3)
Total Cholesterol	197	<200	
LDL - Cholesterol	124	40 - 130	Borderline High (2)
HDL - Cholesterol	42	>40	Borderline (3)
Triglycerides	157	30 - 150	Borderline High (4)
Non - HDL- Chol (calc)	155	<160	Borderline (5)

LPP+ Benefits

- Provides much more accurate CVD risk and treatment guidelines than conventional testing
- Detects all new NCEP risk factors, including Lp(a), RLP, HDL2b and small, dense LDL
- Accurately measures the lipoprotein subgroups of VLDL, LDL and HDL
- Helps identify the 50% of people that are at risk for CVD but have "normal" cholesterol levels

Who should take the LPP Test?

- All patients, and especially those who:
  - Have a family history of heart disease or diabetes
  - Have been diagnosed with heart disease or diabetes
  - Are already taking cholesterol-lowering medications
  - Have been diagnosed with Metabolic Syndrome (high blood pressure)
  - Are overweight
  - Have high LDL - the bad cholesterol
  - Have low HDL - the good cholesterol
  - Have high triglycerides
- Requires a blood draw; they have many draw sites available

Dyslipidemia Case Study

- 70 yo male, heart bypass surgery 1995, (-) reaction to statins
- No current medications
- Very active – daily activity/workouts
- Consumes anti-inflammatory diet; daily food diary

Initial LPP Results

Biomarker	Reference Value	28-Apr-10
Total Cholesterol	<200	229
LDL-Calc	<130	149
HDL	>40	66
Trigs	<150	74
Homocysteine	<7	8.8
LPP# - LDL Total	<900	1028
LPP# - RLP	<150	117
Dense LDL III	<300	310
Buoyant HDL2b	>1400	2637
Lp(a)	<30	<5
ApoB-100	<80	93

Recommendations

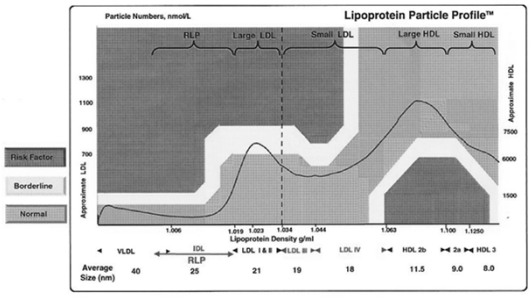
Remedy/Supplement	Upon rising	Breakfast	Mid – morning	Lunch	Mid – afternoon	Dinner	Before retiring
OmegaGenics EPA-DHA 720 (EPA-DHA 720)		1				1	
Lipotain		1					
Red Yeast Extract		1				1	
Cardioauxin		2				2	
CoQ10 (100 mg)		1				1	
Vessel Care		1				1	

Notes:

- **Water – drink 2-2.5 quarts of water/tea daily in divided doses (4 oz. (1/2 cup) every 30 minutes optimal)**
- **Exercise – 30-60 minutes 5-7x/week; at least 30 minutes 5x/week interval training (skiing, biking) or HIIT (weights/aerobic)**
- **Deep breathing – several times daily**
- **Take at least 30 minutes daily to do something you LOVE to do**

LPP Results

Biomarker	Reference Value	28-Apr-10	7-Jun-11
Total Cholesterol	<200	229	224
LDL-Calc	<130	149	124
HDL	>40	66	82
Trigs	<150	74	97
TC:HDL	<4	3.47	2.73
Homocysteine	<7	8.8	5.9
LPP# - LDL Total	<900	1028	791
LPP# - RLP	<150	117	65
Dense LDL III	<300	310	222
Buoyant HDL2b	>1400	2637	3681
Lp(a)	<30	<5	<5
ApoB-100	<80	93	82



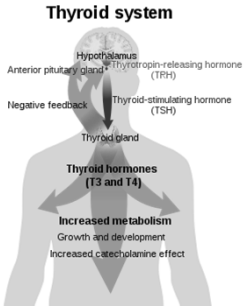
Questions???

Chad Oler, ND

WCA 48 Hr Nutrition Certification Module 2: Day 2

Thyroid Panel

- TSH
  - Standard range: 0.2-5.5 µU/ml
  - Optimal range: <2.0 µU/ml
  - TSH high: hypothyroidism
  - TSH low: hyperthyroidism
- Free T3 (not Total)
- Free T4 (not Total)
- Run TSH, Free T3 and Free T4 to get a more accurate assessment of thyroid fxn



Vitamin D: 25-OH Vitamin D

- Normal range: 20-80 ng/ml
- Optimal range
  - Healthy: 50-60 ng/ml
  - Auto-immune, chronic pain, osteoporosis: 80-100 ng/ml
  - Toxic: >150 ng/ml
- Adults: 4000-8000 IU/day
- Children: 1000-2000 IU/day

Glucose Tolerance Test (GTT) & Insulin Response

- Patient drinks 75 gram glucose solution after fasting 12 hrs
- Blood drawn fasting and at 2-hr post-glucose
- Test glucose and insulin

Lab Test	Optimal Values (U.S.)
Glucose: Fasting	80-90 mg/dl
Glucose: 2 hour	100-110 mg/dl
Insulin: Fasting	< 15 µ/ml (4 µ/ml ideal)
Insulin: 2 hour	< 30 µ/ml

GTT/Insulin Response: When to Order

- Diabetes mellitus
- Insulin resistance/Obesity
- Hypertriglyceridemia
- Neuropathy
- Impotence renal disease
- Retinopathy
- Sugar in urine
- Hypoglycemia
- Malabsorption
- Drugs that may interfere with results:
  - Hormones, oral contraceptives
  - Salicylates
  - Diuretic agents
  - Hypoglycemic agents

Insulin Resistance Questionnaire

Insulin Resistance Questionnaire

Not all products listed would be needed in all cases. Products are listed in sequence of importance.

Presence of associated diseases or biochemical abnormalities	
Hyperglycemia:	
• Type 2 diabetes	4
• Impaired glucose tolerance (IGT)	4
• Gestational diabetes	3
• Impaired fasting glucose (110-125 mg/dl)	2
Hypertriglyceridemia (fasting):	
• Triglycerides > 150 mg/dl (HDL cholesterol < 35)	3
• Triglycerides > 150 mg/dl	2
• Triglycerides > 100-150 mg/dl	1
Essential hypertension:	
• Blood pressure ≥ 140/90 mmHg	2
• Blood pressure ≥ 120-140/80-90 mmHg	1
Polycystic ovaries	4
Premature coronary heart disease (under age 60 years)	3
Uric acid (> 8 mg/dl)	2
Family history (first-degree relatives)	
Type 2 diabetes or impaired glucose tolerance	3
Essential hypertension (under age 60 years)	2
Hypertriglyceridemia	3
Premature coronary heart disease (under age 60 years)	2
Presence of predisposing factors	
Low birth weight (< 2.5 kg)	2
Inactivity (< 90 min aerobic exercise/week)	2
Evidence of mild obesity or central adiposity (maximum 4 points)	
Weight gain (> 4, 8, or 12 kg after age 18 years (30th, 37 years 30th)	1-3
BMI (25-29, 29-27 kg/m2	1, 2
Waist (inches):	
• 28-30, > 30 (W)	1, 2
• 34-36, > 36 (M)	1, 2
Ethnic group at high risk*	1-3

Stages of Insulin Sensitivity

- Stage 1
  - Normal fasting glucose, normal fasting insulin, normal or LOW (<80 mg/dl) 2 hr glucose, ↑ 2 hr insulin (>30 µ/ml)
- Stage 2
  - Normal fasting glucose, normal fasting insulin, ↑ 2 hr glucose (>110 mg/dl), ↑ 2 hr insulin (>30 µ/ml)
- Stage 3
  - Normal fasting glucose, ↑ fasting insulin (> 4 µ/ml), ↑ 2 hr glucose (>110 mg/dl), ↑ 2 hr insulin (>30 µ/ml)
- Stage 4
  - ↑ fasting glucose (>90 mg/dl), ↑ fasting insulin (> 4 µ/ml), ↑ 2 hr glucose (>110 mg/dl), ↑ 2 hr insulin (>30 µ/ml)

Case Study: Ashley A.

- Anxiety
- Sugar cravings/very hungry
- Feel worse 1-3 hours after eating
  - Fatigue
  - Dizzy/faint/light-headed
  - Shaking
  - Headache
- Poor sleep

Ideal Values

Analyte	Fasting	1 hr	2 hr	4 hr
Glucose (mg/dL)	70-90	120-170	100-110	100
Insulin (U/L)	4	< 30	< 30	< 15

Test #1

Analyte	Fasting	1 hr	2 hr	4 hr
Glucose (mg/dL)	88	86L	61L	90
Insulin (U/L)	8.7	65.5H	20.8	7.0

Case Study: Ashley A.

- Balance protein, fat and carbohydrates
- NEVER eat carbs alone
- Start day with protein/smoothie
- Small meals every 2-3 hours
- Eat protein-rich snack before bed

Ideal Values

Analyte	Fasting	1 hr	2 hr	4 hr
Glucose (mg/dL)	70-90	120-170	100-110	100
Insulin (U/L)	4	< 30	< 30	< 15

Test #1

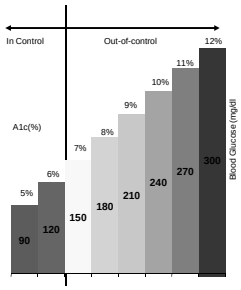
Analyte	Fasting	1 hr	2 hr	4 hr
Glucose (mg/dL)	88	86L	61L	90
Insulin (U/L)	8.7	65.5H	20.8	7.0

Test #2

Analyte	Fasting	1 hr	2 hr
Glucose (mg/dL)	88	136	81
Insulin (U/L)	7.7	36.1H	7.7

Lab Work: HgA1c

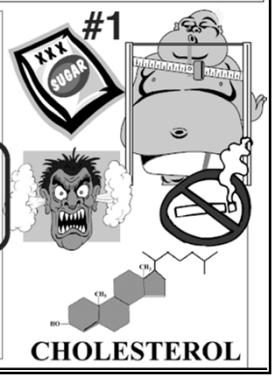
- Hemoglobin A1C is the component of hemoglobin that most strongly binds with glucose
- % HgA1C is a strong indicator of blood glucose levels over past 100-120 days (life span of RBC)
- Normal values
  - 2.0%-4.9%: Non-diabetic adult
  - 2.5%-5.9%: Good diabetic control
  - > 6.0%: Diabetes/poor diabetic control



Glycated haemoglobin, diabetes, and mortality in men in Norfolk cohort of European Prospective Investigation of Cancer and Nutrition (EPIC-Norfolk) Kay-Tee Khaw, Nicholas Wareham, Robert Luben, Sheila Bingham, Suzy Oakes, Ailsa Welch, Nicholas Day
BMJ Volume 322 6 January 2001 bmj.com

*

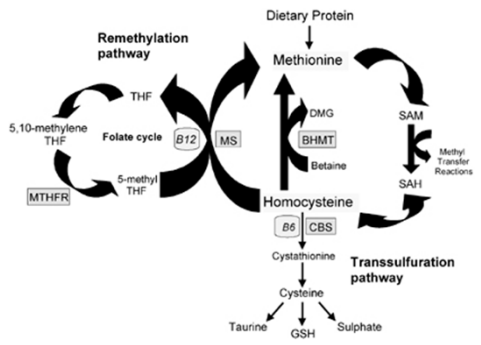
"Results: Men with known diabetes had increased mortality from all causes, lowest rates in those with HbA1c concentrations below 5%. An increase of 1% in HbA1c was associated with a 28% (P<0.002) increase in risk of death independent of age, blood pressure, serum cholesterol, body mass index, and cigarette smoking habit;"



Lab Work: Homocysteine

- Intermediate amino acid formed during methionine metabolism

Homocysteine



Lab Work: Homocysteine

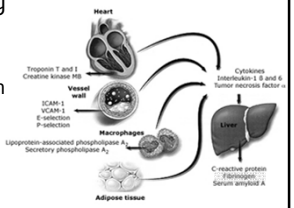
- Intermediate amino acid formed during methionine metabolism
- Important predictor of coronary, cerebral and/or peripheral vascular disease
- Promotes the progression of atherosclerosis (by causing endothelial damage, & LDL oxidation
- High homocysteine = 5x risk of stroke, dementia and Alzheimer's disease
- Associated with deficiency of B6, B12, folic acid and/or trimethylglycine (TMG)
- Optimal is ~6.2 µ/L (<10 µ/L acceptable)
- For every 3 points above 6.3, there is a 35% increased risk of heart attack or stroke

Lab Work: hs-CRP

- High sensitivity C-Reactive Protein
  - Nonspecific, acute phase reactant protein which increases with inflammation, infection or cell injury
  - "high sensitivity" – lower limits of detection than CRP
  - Normal: < 1.0 mg/dL
    - High risk: > 3.0 mg/dL: ↑ risk of CV event 300%
    - > 15 mg/dL indicates non-cardiovascular specific inflammation
  - High hs-CRP associated with insulin resistance, metabolic syndrome, VAT, CVD & systemic inflammatory states/disorders

Lab Work: Fibrinogen

- Manufactured by liver; important in blood clotting
- Elevated fibrinogen associated with CVD risk
  - Enhancement of coagulation & increased blood viscosity
- Smoking, stress, obesity, insulin resistance and oral contraceptives all increase
- Reference range: 200-400 mg/dL



Optimal Lab Values

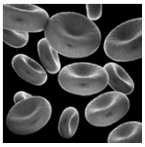
Lab Test	Optimal Values (U.S.)
Triglycerides	< 150 mg/dl
HDL	Male: > 40 mg/dl Female: > 50 mg/dl
Glucose: Fasting	80-90 mg/dl
Glucose: 2 hour	100-110 mg/dl
Insulin: Fasting	< 15 µ/ml (4 µ/ml ideal)
Insulin: 2 hour	< 30 µ/ml
Homocysteine	< 8 mmol/L
HbA1C	5.0%
Hs-CRP	< 0.7 mg/L
Blood pressure	< 130/85 mm Hg
Waist Circumference (WC)	Male: < 40" Female: < 35"

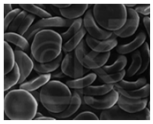
Evaluating Overall CV Health/Risk

RISK FACTOR	OPTIMUM	RISK	SERIOUS RISK
C-reactive Protein	<1	>2	>3
Fasting Glucose	87	>100	>110
Fibrinogen	<235	>235	>350
Homocysteine	<8	>8	>12
Lipoprotein(a) mg/dl	<20	>25	>30
HDL (men)	>60	<50	<40
HDL (women)	>70	<60	<50
Triglycerides (TG)	<100	>100	>150
TG/HDL ratio	1:1	2:1	4:1
VLDL	<20	>30	>40

Lab Work: ESR (SED Rate)

- Erythrocyte (RBC) Sedimentation Rate
  - Measures rate at which RBCs settle out of blood in one hour
  - Increased during inflammatory states and infection
    - RBCs become "sticky", clump together and settle faster
  - Normal: Male: < 15 mm/hr; Female: < 20 mm/hr





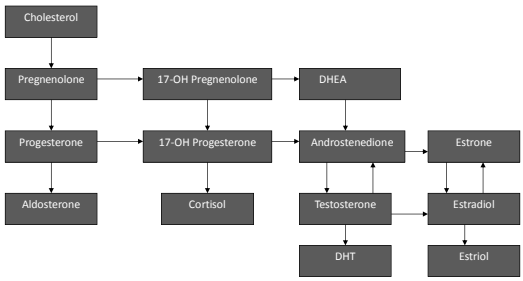
Lab Work: Ferritin

- Ferritin is the major iron-storage protein
- Test when suspect iron deficiency
  - Normal: Male: 18-270 ng/mL; Female: 18-160 ng/mL
  - Fatigue can arise < 35 ng/mL
  - Decreased with iron deficiency, chronic bleed
  - Increased with macrocytic anemia (B12, Intrinsic factor, folic acid deficiency); iron overdose, inflammation

Lab Work: Sex hormones/SHBG

- Male Sex Hormones:
- Androstenedione
- Dehydroepiandrosterone (DHEA)
- Dihydrotestosterone (DHT)
- Testosterone
- Female Sex Hormones:
- Estrogens:
  - Estradiol
  - Estriol
  - Estrone
- Progesterone

Sex Hormone Synthesis



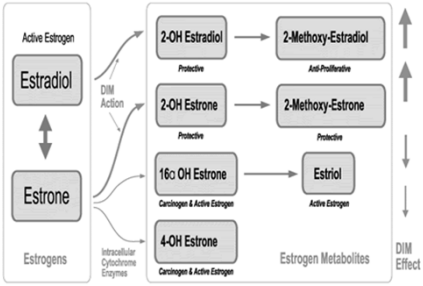
Signs of Sex Hormone Imbalance

- Hot flashes
- Migraines
- Night Sweats
- Vaginal Dryness
- Hair Loss
- Insomnia
- Fibroids
- Endometriosis
- Depression
- Acne
- Muscle Loss
- Osteoporosis
- Low Sex Drive
- Dry Skin
- Irritability
- Weight Gain
- Poor Weight Loss
- Anxiety

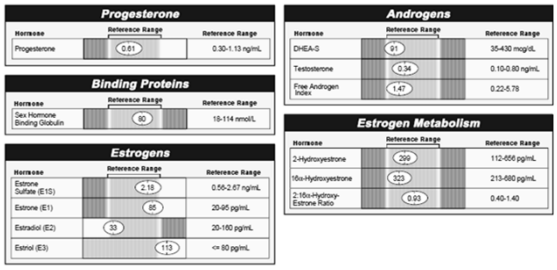
Sex Hormone Imbalances

- Imbalances between estrogen and progesterone
  - Low estrogen
  - Estrogen Dominance
  - Hormone Therapy (Birth control, HRT)
- Imbalances with Testosterone
- Imbalances with DHEA

Estrogen Metabolism



Lab Work: Sex hormones/SHBG



Progesterone

Hormone	Reference Range	Reference Range
Progesterone	0.61	0.30-1.13 ng/mL

Binding Proteins

Hormone	Reference Range	Reference Range
Sex Hormone Binding Globulin	80	18-114 nmol/L

Estrogens

Hormone	Reference Range	Reference Range
Estrone Sulfate (E1S)	2.18	0.56-2.67 ng/mL
Estrone (E1)	95	20-95 pg/mL
Estradiol (E2)	33	20-160 pg/mL
Estriol (E3)	113	<= 80 pg/mL

Androgens

Hormone	Reference Range	Reference Range
DHEA-S	91	35-430 mcg/dL
Testosterone	0.34	0.10-0.80 ng/mL
Free Androgen Index	1.47	0.22-5.78

Estrogen Metabolism

Hormone	Reference Range	Reference Range
2-Hydroxyestrone	299	112-656 pg/mL
16α-Hydroxyestrone	323	213-680 pg/mL
2:16α-Hydroxy-Estrone Ratio	0.93	0.40-1.40

Lab Work: Sex hormones/SHBG

Blood Tests

		Reference Range
DHEA Sulfate (serum)	<30	70-310 mcg/dL

Gender	Age	Reference Range
Female	20 to 29 yrs	65-380 mcg/dL
	30 to 39 yrs	45-270 mcg/dL
	40 to 49 yrs	32-240 mcg/dL
	50 to 59 yrs	30-200 mcg/dL
	60 to 69 yrs	30-150 mcg/dL
	Over 69 yrs	30-90 mcg/dL
Male	20 to 29 yrs	280-640 mcg/dL
	30 to 39 yrs	120-530 mcg/dL
	40 to 49 yrs	95-530 mcg/dL
	50 to 59 yrs	75-310 mcg/dL
	60 to 69 yrs	42-296 mcg/dL
	Over 69 yrs	30-175 mcg/dL

Sex Hormone Binding Globulin, SHBG (serum)	16	7-100 nmol/L
Estradiol (serum)	65	

Phase	Reference Range
Follicular	20-150 pg/mL
Luteal	21-240 pg/mL
Menopausal	20-24 pg/mL
Menopausal + HRT	20-150 pg/mL
Male	<= 55 pg/mL

Free Testosterone (serum)*	4.16	

Phase	Reference Range
Follicular	0.45-3.11 pg/mL
Luteal	0.45-2.48 pg/mL
Menopausal	0.2o-1.13 pg/mL
Menopausal + HRT	0.45-3.11 pg/mL
Male	8.5o-54.56 pg/mL

Dihydrotestosterone, DHT (serum)	8.3		29.0-90.0 ng/dL

Gender	Reference Range
Female	3.0-28.0 ng/dL
Male	30.0-90.0 ng/dL

Lab Work: Urinalysis/culture

- Confirm in-house dipstick abnormalities
  - UTI
  - Sugar
  - Ketones
  - Blood
  - Proteins

Urinalysis/Culture

•Appearance, color	•Cloudy, dark may indicate infection/kidney issue (bacteria, pus, blood)
pH	•Assess overall acidity/kidney function •pH>6.8: impaired kidney or UTI
Leukocyte Esterase/ Leukocytes/WBC	•(+): infection or contamination
Nitrite	•(+) with (+) leukocyte: UTI
Protein	•Presence may indicate kidney disease
Glucose	•Presence may indicate diabetes; liver disease, pregnancy
Specific Gravity	•1.005-1.030 – assess hydration, protein, glucose
Ketones	•Presence may indicate insufficient carb intake/utilization; insufficient insulin (diabetes)
Blood (hemoglobin)	•Disease of kidney/urinary tract, contamination
Bilirubin/Urobilinogen	•Liver disease, biliary obstruction, hemolytic anemia

Chronic Disease Risks and CardioMetabolic Syndrome; Men (US)

	Optimal	Diagnostic Ranges	Date	Date	Date	Date	Date
Waist Circumference	**<40 in**	☐ >40 inches	☐	☐	☐	☐	☐
Triglyceride	**<150 mg/dl**	☐ >150	☐	☐	☐	☐	☐
HDL	**>40 mg/dl**	☐ <40	☐	☐	☐	☐	☐
Blood Pressure	**110/70**	☐ >130/85	☐	☐	☐	☐	☐
Fasting Glucose	**80-90 mg/dl**	☐ >100 CMS	☐	☐	☐	☐	☐
CardioMetabolic Syndrome	**0 of 5**	**3 of the 5 criteria**	☐	☐	☐	☐	☐
Total Cholesterol	**160-200 mg/dl**	>200					
LDL	**100-130 mg/dl**	<130 non DM/CMS <100 DM/CMS/CVD					
Trig/HDL	**<3.0**	>3.0 Screen for Insulin Resist.					
Fasting Glucose	**80-90 mg/dl**	>100 CMS >126 DMII					
Fasting Insulin	**4-5 units/ml**	>14					
2 hour Glucose	**80-120 mg/dl**	>200					
2 hour Insulin	**<30 units/ml**	>50					
HgbA1C	**<5.5**	5.5-5.9 Ins Resist >6.0 DMII in control >7.0 DM poor control >8.0 DM out of control					
Apo B/A1	**<.6**	none					
Homocysteine	**<8mmol/L**	< 8 mmol/L					
High Sensitivity CRP	**<.7mg/L**	>1.0 Inflammatory >3.0 CV Risk					
AST		>40 U/liter					
ALT		>55 U/liter					
GGT	**< 23 U/liter**	>94 U/liter					
Albumin		3.1-4.3 g/dl					
BUN		8-25 mg/dl					
Creatinine	**< 1.1 mg/dl**	0.6-1.5 mg/dl					
BUN/Creatinine ratio	**10-20:1**	>20					
25-OH D3	**40-80 ng/ml – general health 70-90 ng/ml - autoimmune dx**	<10 ng/ml Deficient <30 ng/ml Insufficient >150 toxicity concern					

All ranges provide general guidelines for classification and should not replace thorough clinical assessment

Functional Testing

Genova Diagnostics / Metametrix Clinical Laboratory
SpectraCell Laboratories
Doctor's Data Inc
DBS Labs – Delivering Better Service
Quest Diagnostics
ELISA/ACT BIOTECHNOLOGIES
LabCorp

Commonly Used Functional Tests

- Genova/Metametrix
  - CDSA 2.0
  - Comprehensive Parasitology
  - Small Intestine Bacterial Overgrowth
  - Toxic Element Clearance
  - Adrenal Stress
  - Menopause/Plus
  - Rhythm/Plus
  - Male Hormone/Plus
  - Organix Profile
  - Fatty Acid Bloodspot
- SpectraCell
  - LPP+
  - Micronutrient Profile
- Elisa/Act
  - LRA
- DBS Labs
  - OCT2 Assay Interpretation

Most Helpful Tests

- CDSA 2.0 w/ Parasitology
- Toxic Element Clearance Profile
- Adrenal Stress Profile
- Organix Profile
- Fatty Acid Bloodspot
- Lipoprotein Particle Testing
- Micronutrient Testing
- Food Hypersensitivity Testing

CDSA 2.0 w/ Parasitology

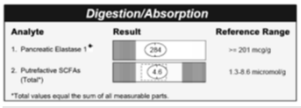
- Best for:

Diarrhea/constipation	Severe gas/bloating
Dysbiosis/antibiotic use	Pancreatic insufficiency
IBS	IBD
Family Hx GI cancers	Gallstones
Autoimmune disease	Chronic pain/inflammation

- Evaluates digestion, absorption, gut microbiology and parasites
- Can differentiate IBS and IBD
- Requires 1-3 stool samples

CDSA 2.0 w/ Parasitology

- Digestion/Absorption
  - Pancreatic enzymes
    - If low – supplement
  - Putrefactive SCFAs
    - Low – low protein diet
    - Elevated – poor protein digestion
      - Hypochlorhydria
      - Pancreatic insufficiency
      - Bacterial overgrowth of small intestine



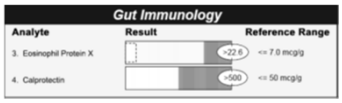
Digestion/Absorption

Analyte	Result	Reference Range
1. Pancreatic Elastase 1*	284	>= 201 mcg/g
2. Putrefactive SCFAs (Total*)	4.6	1.3-8.6 micromol/g

*Total values equal the sum of all measurable parts.

CDSA 2.0 w/ Parasitology

- Gut immunology – IBS vs. IBD

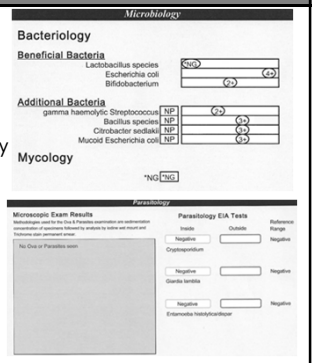


Gut Immunology		
Analyte	Result	Reference Range
3. Eosinophil Protein X	>22.6	<= 7.0 mcg/g
4. Calprotectin	>500	<= 50 mcg/g

  - Eosinophil Protein X
    - Elevated – food allergy, IBD
  - Calprotectin – level of inflammation
    - 50-100 mcg/g: low grade inflammation
      - Post-infectious IBS, food allergies, NSAIDs, IBD (in remission)
    - >150 mcg/g: significant inflammation
      - IBD (active), infection, food allergies, NSAIDs, colon cancer, diverticulitis

CDSA 2.0 w/ Parasitology

- Microbiology
  - Beneficial flora
    - Lactobacilli & E. coli > 2+
    - Bifidobacteria 4+
  - Additional flora & Mycology
    - Identify dysbiosis
  - Parasitology
  - Includes susceptibility profile of antibiotics and natural agents



Microbiology

Bacteriology

Beneficial Bacteria

Lactobacillus species	NHG	
Escherichia coli		(4+)
Bifidobacterium		(2+)

Additional Bacteria

gamma haemolytic Streptococcus	NP	(2+)
Bacillus species	NP	(1+)
Citrobacter sedlakii	NP	(1+)
Mucoid Escherichia coli	NP	(1+)

Mycology

*NG NG

Parasitology

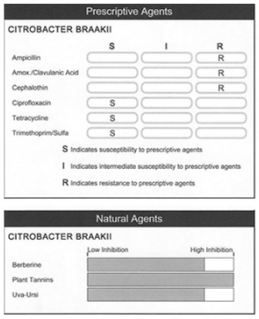
Microscopic Exam Results

Methodologies used for the Ova & Parasites examination are sedimentation concentration of specimens followed by analysis by iodine wet mount and Trichrome stain permanent smear.

No Ova or Parasites seen

Parasitology EIA Tests	Inside	Outside	Reference Range
Cryptosporidium	Negative		Negative
Giardia lamblia	Negative		Negative
Entamoeba histolyticaidispar	Negative		Negative

CDSA 2.0 w/ Parasitology



Prescriptive Agents

CITROBACTER BRAAKII

	S	I	R
Ampicillin			R
Amox./Clavulanic Acid			R
Cephalothin			R
Ciprofloxacin	S		
Tetracycline	S		
Trimethoprim/Sulfa	S		

S Indicates susceptibility to prescriptive agents

I Indicates intermediate susceptibility to prescriptive agents

R Indicates resistance to prescriptive agents

Natural Agents

CITROBACTER BRAAKII

	Low Inhibition	High Inhibition
Berberine		
Plant Tannins		
Uva-Ursi		

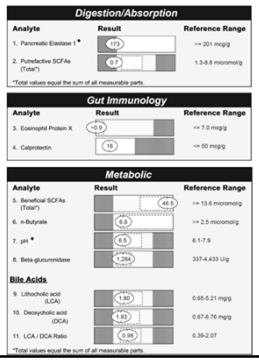
Prescriptive Agents:
Microbial testing has been performed in vitro to determine antibiotic sensitivity and resistance at standard dosages. Prudent use of antimicrobials requires knowledge of appropriate blood or tissue levels of those agents. Antibiotics that appear in the "S" (susceptible) column are more effective at inhibiting the growth of this organism. Antibiotics that appear in the "I" (intermediate) column are partially effective at inhibiting the growth of this organism. Antibiotics that appear in the "R" (resistant) column allow continued growth of the organism in vitro and are usually less effective clinically. Inappropriate use of antibacterials often results in the emergence of resistance.

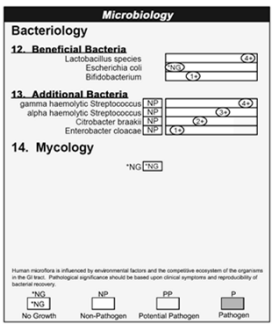
Natural Agents:
In this assay, "inhibition" is defined as the reduction level on organism growth as a direct result of inhibition by a natural substance. The level of inhibition is an indicator of how effective the natural substance was at limiting the growth of an organism in an in vitro environment. High inhibition indicates a greater ability by the natural substance to limit growth, while Low Inhibition a lesser ability to limit growth. These natural products should be considered investigational in nature and not be viewed as standard clinical treatment substances.

CDSA 2.0 w/ Parasitology

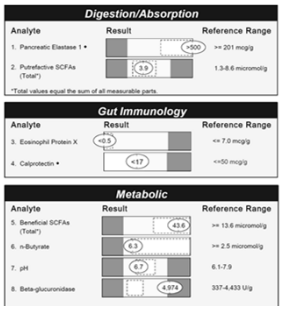
- Metabolic markers
  - pH
    - Low <6.1: carbohydrate maldigestion /malabsorption, rapid transit time, SIBO
    - High >7.9: high protein and/or low fiber diet, slow transit time, hypochlorhydria, dysbiosis
  - Beta-glucuronidase
    - High >4433 U/g: increased activation and recirculation of toxins, hormones and drugs
      - Increased risk of colon, prostate and breast cancers

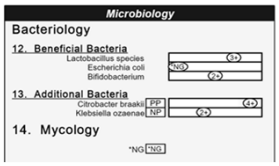
CDSA: Case Study #1





CDSA: Case Study #2





CDSA: Case Study #2

Prescriptive Agents

CITROBACTER BRAAKII

	S	I	R
Ampicillin			R
Amox./Clavulanic Acid			R
Cephalothin			R
Ciprofloxacin	S		
Tetracycline	S		
Trimethoprim/Sulfa	S		

S Indicates susceptibility to prescriptive agents

I Indicates intermediate susceptibility to prescriptive agents

R Indicates resistance to prescriptive agents

Natural Agents

CITROBACTER BRAAKII

Low Inhibition — High Inhibition

Berberine

Plant Tannins

Uva-Ursi

CDSA 2.0 w/ Parasitology

- Best for:

Diarrhea/constipation	Severe gas/bloating
Dysbiosis/antibiotic use	Pancreatic insufficiency
IBS	IBD
Family Hx GI cancers	Gallstones
Autoimmune disease	Chronic pain/inflammation

- Evaluates digestion, absorption, gut microbiology and parasites
- Can differentiate IBS and IBD
- Requires 1-3 stool samples

Toxic Element Clearance Profile

- Best for:
  - Identifying heavy metal exposure/storage
    - Suspect if poor detoxification and/or symptoms of exposure
- Ideally do both pre- and post- provocation (chelation)
  - Pre-chelation – indicates recent exposure
  - Post-chelation – measure of total-body burden (stored)
  - Can compare the two to evaluate exposure and guide recommendations
- Requires 24 hr urine collection

Elevated Toxic Element	Associated Symptoms and Diseases	Sources	Protective Measures	Chelating Agents
Aluminum	Abnormal speech, myoclonic jerks, osteomalacia, progressive encephalopathy, Alzheimer's disease, Parkinson's disease	Aluminum cookware, antacids, drinking water, tobacco, and cannabis smoke	Adequate iron (check ferritin), glycine, calcium, phosphorus (lowers intestinal absorption)	DFO, DMHP
Arsenic	Peripheral arteriosclerosis ("blackfoot disease") "rice-water" stools, proteinuria, hyperkeratosis, "milk and roses" hyperpigmentation, garlic breath odor, stomatitis	Metal foundry, drinking water, seafood, glues, industrial exposure, contaminated wine, contaminated herbal supplements, cigarette smoke, arsenic-treated wood	Selenium, *Emblica officinalis*, sulfur amino acids, glutathione	DMSA, DMPS, DMPA
Cadmium	Femoral pain, lumbago, osteopenia, renal dysfunction, hypertension, vascular disease	Industry, spray paint, tobacco smoke, car emissions, plants grown in cadmium-rich soil	Zinc, iron, antioxidants	EDTA; DMSA and NAC (experimental)
Lead	Microcytic hypochromic anemia, renal dysfunction, hypertension, anorexia, muscle discomfort, constipation, metallic taste, low IQ (children)	Certain supplements, paint, contaminated soils (and plants grown in them), plumbing	Alpha lipoic acid-protection against toxicity, iron (reduces intestinal absorption	Ca –EDTA
Mercury	Mental symptoms (erethism, insomnia, fatigue, poor short- term memory), tremor, stomatitis, gingivitis, GI and renal disturbances, decreased immunity	Dental amalgams, fish consumption, preservatives (esp. thimerosal), industrial release effects)	Selenium (protects against cellular toxicity	DMSA, DMPS

Common Chelating Agents

Name	Abbreviation	Administration	Metals Bound
2,3-Dimercapto-1-propane sulfonic acid	DMPS	IV, Oral	Arsenic, lead, mercury
Meso-2,3-dimercaptosuccinic acid or succimer	DMSA	IV, Oral	Arsenic, copper, lead, mercury
Dimercaprol (British anti-Lewisite)	BAL	IV	Arsenic, copper, lead, mercury
D-Penicillamine (Cuprimine, Depen)	DPA	IV	Arsenic, copper, lead, mercury
Desferoxamine	DFO	IV	Aluminum, iron
Calcium disodium ethylenediaminetetraacetic acid	$CaNa_2$-EDTA	IV, rectal suppositories	Cadmium, lead, manganese

- DMSA very good to use for post-provocation challenge
  - Nutri-DMSA – 9 capsules after dinner, collect urine for next 24 hours

Managing Clients with Metal Toxicity

- Identify & avoid exposure to toxic element
- Increase elimination by supporting GI, liver and kidney function
- Protect against damage
- Consider oral or IV chelation if warranted
- Retest after 3-6 months
- Use outside consultations if needed

Managing Clients with Metal Toxicity

- Identify & avoid exposure to toxic element
  - Test water
  - Evaluate cooking utensils
  - Evaluate building materials in home/office
  - Diet: eat organic; consider seafood as a source
  - Evaluate herbal supplements for contamination
  - See following tables for other sources

Sources of Toxic Metals

Aluminum	Cadmium	Lead	Mercury	Arsenic
Aluminum cooking utensils	Drinking water	Some red lipsticks and painted toys	Dental amalgams	Rat poisons
Baking powder (Al sulfate)	Soft water (from galvanized pipes)	Leaded house paint	Broken thermometers and barometers	Automobile exhaust
Antacids (certain brands, see labels)	Soft drinks from dispensing devices with galvanized plumbing	Drinking water from lead plumbing	Grain seeds treated with methylmercury fungicide	Household detergents
Antiperspirants	Refined wheat flour	Vegetables grown in Pb-contaminated soil	Predator fish, certain lake fish	Wood preservatives
Aluminum cans	Canned evaporated milk	Canned fruit and juices, canned evaporated milk, boxed wines	Mercuric chloride Thimerosal (Ethylmercurithiosalicylic acid sodium salt)	Insecticide residues on fruits and vegetables
Drinking water (alum used as bactericide)	Processed foods	Certain Chinese and Ayurvedic herbal preparations	Calomel (body powder, talc, laxatives)	Wine (if arsenic in pesticides used)
Milk and milk products (from equipment)	Oysters, kidney, liver	Milk from animals grazing on Pb-contaminated land	Cosmetics (check labels if possible)	Colored chalk
Alum in pickled foods (check labels)	Cigarette smoke, tobacco products	Bone meal	Latex and solvent-thinned paints	Wallpaper dye and plaster
Nasal spray	Superphosphate fertilizers	Organ meats such as liver	Hemorrhoid suppositories	Drinking water, seawater, well water

Sources of Toxic Metals

Aluminum	Cadmium	Lead	Mercury	Arsenic
Toothpaste	Dental appliances	Lead-arsenate pesticides	Mercurochrome, merthiolate	Sewage disposal
Ceramics (made from Al 203 clay)	Ceramic glazes	Leaded caps on wine bottles	Fabric softeners	Seafood (source of non-toxic arsenic)
Dental amalgams	Paint pigments	Rainwater and snow	Floor waxes and polishes	Chicken
Cigarette filters and tobacco smoke	Electroplating	Improperly glazed pottery	Air conditioner filters	
Automotive exhausts	Silver polish	Painted glassware	Wood preservatives	
Pesticides	Polyvinyl plastics	Painted pencils	Certain batteries	
FD&C color additives	Rubber carpet backing	Toothpaste	Fungicides for lawns and shrubs	
Vanilla powder	Nickel-Cadmium batteries	Newsprint	Leather tanning products	
Table salt, seasonings	Rust-proofing materials	Colored printed materials	Thimerosal-preserved immunization fluids	
Bleached flour		Eating utensils	Adhesives	
American cheese		Curtain weights	Skin-lightening creams	
Medications containing kaolin (Al silicate)		Putty	Certain ointments to treat psoriasis	
Sutures with wound-healing coatings		Car batteries	Photoengraving	
Rat poisons		Cigarette ash, tobacco	Tattooing	
		Lead shot, firing ranges	Sewage sludge used as fertilizer	

Managing Clients with Metal Toxicity

- Increase elimination by supporting GI, liver, kidney and skin function
  - Proper ***Medical Food for detoxification*** protocol
  - ***Kidney detoxification formula*** - 1 capsule BID
  - ***Heavy metal detox formula*** - 3 tablets BID with food
  - Chelation agent (based on metal(s)
    - ***Nutri DMSA*** – 1-4 capsules before bed
    - ***Metal Detox*** – 3-6 capsules daily
  - Sauna (↑ water consumption accordingly)
  - Dry skin brushing – on dry skin 1-2x/day
  - Reduce intestinal absorption

Medical food for detoxification formula

Serving Size: Two Scoops (40 g)
Servings Per Container: 21
One serving supplies:

Calories	130
Fat	3 g
Saturated Fat†	1 g
Trans Fat	0 g
Cholesterol	0 mg
Sodium	220 mg
Potassium	520 mg
Carbohydrate	20 g
Dietary Fiber	3 g
Sugars	6 g
Protein	12 g
Vitamin A (as retinyl palmitate)	1000 IU
Vitamin A (as beta-carotene)	4000 IU
Vitamin C (as ascorbic acid)	300 mg
Calcium (as calcium citrate and dicalcium phosphate)	150 mg
Iron (as ferrous fumarate)	1 mg
Vitamin D (as cholecalciferol)	35 IU
Vitamin E (as d-alpha tocopheryl acetate)	42 IU
Thiamin (as thiamin HCl)	2 mg
Riboflavin	2 mg
Niacin (as niacinamide)	7 mg
Vitamin B6 (as pyridoxine HCl)	3.4 mg
Folate (as folic acid)	80 mcg
Vitamin B12 (as cyanocobalamin)	3.6 mcg
Biotin	135 mcg
Pantothenic Acid (as D-calcium pantothenate)	36 mg
Phosphorus (as dipotassium phosphate and dicalcium phosphate)	230 mg
Iodine (as potassium iodide)	53 mcg
Magnesium (as magnesium citrate and sulfate)	160 mg
Zinc (as zinc gluconate)	10 mg
Copper (as copper gluconate)	1 mg
Manganese	1 mg
Chromium (as chromium polynicotinate)	50 mcg
Proprietary Spent Hops (*Humulus lupulus*) Powder	1000 mg
L-Glycine	800 mg
Prune (*Prunus domestica*) Skin Extract	125 mg
L-Glutamine	100 mg
Watercress (*Nasturtium officinale*) Whole Plant Extract	67 mg
Ellagic Acid [from pomegranate (*Punica granatum*) Whole Fruit Extract]	50 mg
DL-Methionine	50 mg
L-Threonine	35 mg
L-Lysine (as L-Lysine HCl)	35 mg
Sulfate (as magnesium sulfate)	20 mg
L-Cysteine (as L-cysteine HCl)	15 mg
Catechins (from decaffeinated green tea extract)	15 mg

Other ingredients: Rice protein concentrate, rice syrup solids, fructose, natural flavors, partially hydrolyzed guar gum, natural flavors, olive oil, medium chain triglycerides, cellulose gum, and silica.

† Saturated fat content is contributed by a beneficial form of fat, medium chain triglycerides, which have recognized health benefits.

Recommendations: Blend, shake, or briskly stir two level scoops into 8-10 ounces of chilled water or juice.

Kidney detox formula

One vegetable capsule supplies:

Vitamin B6 (as pyridoxine HCl)	10 mg
Folate (as folic acid and L-5-methyltetrahydrofolate†)	400 mcg
Vitamin B12 (as cyanocobalamin)	125 mcg
Cordyceps Mycelium Extract (*Paecilomyces hepiali* Chen) [standardized to 4% (8mg) cordycepic acid and 0.25% (0.5mg) adenosine]	200 mg
Chinese Salvia Root (*Salvia miltiorrhiza*)	200 mg
N-Acetylcysteine	200 mg

Other ingredients: Capsule (hydroxypropylmethylcellulose), microcrystalline cellulose, and magnesium stearate (vegetable).

† As Metafolin® U.S. Patent Nos. 5,997,915; 6,254,904.

Recommendations: Take one capsule one to two times daily or as directed by your healthcare practitioner.

Warning: Do not use if taking blood-thinning medications, anti-hypertensive medications, digoxin or nitroglycerin, or before surgery.

Heavy metal detox formula

One tablet supplies:

Zinc (as zinc citrate)	1.7 mg
Andrographis (*Andrographis paniculata*) Aerial Parts Extract	50 mg
Turmeric Rhizome Extract (*Curcuma longa*) [standardized to 95% (150 mg) curcuminoids]	52.5 mg
Proprietary Blend of Hops (*Humulus lupulus*) and Luduxin™†	882 mg

Other ingredients: Microcrystalline cellulose, cellulose, stearic acid (vegetable), croscarmellose sodium, silica, and coating (water, hypromellose, medium chain triglycerides, and hydroxypropylcellulose).

† Luduxin™ consists of reduced-iso-alpha acids (from hops extract *Humulus lupulus*) and magnesium salt produced via a proprietary process. Based on clinical evaluations at the Functional Medicine Research Center℠—the clinical research arm of Metagenics.

Recommendations: Take as directed by your healthcare practitioner.

Nutri DMSA

One capsule supplies:

Dimercaptosuccinic Acid	100 mg

Other ingredients: Rice flour, magnesium stearate, and gelatin.

Recommendations: Take as directed by your healthcare practitioner.

Metal detox formula

Three capsules supply:

Thiamin (vitamin B1)	75 mg
Garlic (organic high allicin)	800 mg
Calcium disodium EDTA (calcium disodium ethylenediamine tetra-acetic acid)	1000 mg
L-Glycine	400 mg
L-Methionine	300 mg
Malic acid	100 mg

Other ingredients: Magnesium stearate, silicon dioxide, and gelatin.

Recommendations: Take three capsules three times daily or as directed by your healthcare practitioner.

Managing Clients with Metal Toxicity

- Reduce intestinal absorption
  - ***Fiber formula's*** – 30-40 grams/day
  - Diet: 1-2 cups beans, 3-6 cups cooked vegetables, whole grains (esp. oatmeal), fresh fruit (esp. apples)
  - Hydration – ½ body weight in ounces + 32 oz.
  - If female and/or ↑ Beta-glucuronidase
    - ***Calcium D-Glucarate Plus*** – 1 cap BID
    - ***Indole -3-carbinol and diindolymethane*** – 1 cap BID/TID

Fiber formula's

Serving Size: One Scoop (8.3 g)
Servings Per Container: 30 (by weight)
Nutritional Information Per Serving:

Calories	5
Total Carbohydrates	8 g
Dietary Fiber	7 g
Soluble Fiber	5 g
Insoluble Fiber	2 g
Vitamin C	60 mg
Sodium	10 mg

Other ingredients: Maltodextrin, psyllium husk powder, cellulose, citric acid, natural flavors, ascorbic acid, Stevia extract (*Stevia rebaudiana*), and beta-carotene (color). **Contains:** Soy.

This product is gluten free and vegetarian.

Recommendations: Blend, shake, or briskly stir one level scoop (8.3 g) of Herbulk® into at least 8-12 ounces of water, juice, or other beverage, or as directed by your healthcare practitioner.

Caution: Taking without enough liquid may cause choking. Do not use if you have difficulty swallowing or are sensitive to inhaled or ingested psyllium.

Serving Size: One Scoop (10 g)
Servings Per Container: 38
One serving supplies:

Calories	15
Calories from Fat	10
Total Fat	1 g
Total Carbohydrate	7 g
Dietary Fiber	6 g
Soluble Fiber	1 g
Insoluble fiber	5 g
Protein	1 g
Sodium	5 mg

Ingredients: Rice bran, beet fiber, oat fiber, apple fiber, cellulose, olive oil, and d-alpha tocopheryl acetate (antioxidant).

Recommendations: Blend, shake, or briskly stir one level scoop (10 g) into eight fluid ounces of juice or other beverage.

Calcium D-glucarate formula

One capsule supplies:

Calcium D Glucarate (63 mg elemental calcium)	500 mg
Folic acid	200 mcg
Vitamin B12 (cyanocobalamin)	500 mcg
Iodine (chelate)	212 mcg

Other ingredients: Rice flour, vegetable capsule, magnesium stearate, and silicon dioxide.

Recommendations: Take one capsule with water twice daily or as directed by your healthcare practitioner.

Indole-3 Carbinol & Diindolymethane

One capsule supplies:

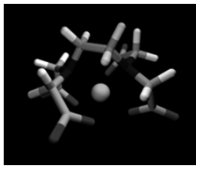
Indole-3 Carbinol	150 mg
Diindolymethane	50 mg

Other ingredients: Rice flour, magnesium stearate, gelatin.

Recommendations: Take one to three capsules daily or as directed by your healthcare practitioner.

Managing Clients with Metal Toxicity

- Protect against damage
  - Chelation works by grabbing metal ions of a certain charge and/or size
  - Many metals (beneficial and potentially hazardous) share a common charge/size



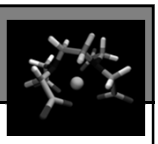
Periodic Table of Ionic Charges and Oxidation Numbers

Each element is shown with its possible oxidation states. **Possible ionic charges are bold**.
Most common oxidation state is underlined.

IA	IIA											IIIA	IVA	VA	VIA	VIIA	VIII
1 H +1 -1																	2 He 0
3 Li +1	4 Be +2											5 B +3	6 C +2,4 -2,-4	7 N -3 +2,3,4,5	8 O -2 -1,+1	9 F -1	10 Ne 0
11 Na +1	12 Mg +2	3	4	5	6	7	8	9	10	11	12	13 Al +3	14 Si +2,4	15 P -3 +3,4,5	16 S -2 +2,4,6	17 Cl -1 +1,3,5,7	18 Ar 0
19 K +1	20 Ca +2	21 Sc +3	22 Ti +3,4	23 V +2,3,4,5	24 Cr +2,3,6	25 Mn +2,3,4,6,7	26 Fe +2,3	27 Co +2,3	28 Ni +2,3	29 Cu +1,2	30 Zn +2	31 Ga +3	32 Ge +4	33 As -3 +3,5	34 Se -2 +2,4,6	35 Br -1 +1,5,7	36 Kr 0,2
37 Rb +1	38 Sr +2	39 Y +3	40 Zr +4	41 Nb +3,5	42 Mo +2,3,4,5,6	43 Tc +7	44 Ru +2,3,4,6,8	45 Rh +2,3,4	46 Pd +2,4	47 Ag +1	48 Cd +2	49 In +3	50 Sn +2,4	51 Sb -3 +3,5	52 Te -2 +2,4,6	53 I -1 +1,5,7	54 Xe 0,2,4,6
55 Cs +1	56 Ba +2	57 La +3	72 Hf +4	73 Ta +5	74 W +2,3,4,5,6	75 Re +2,4,6,7 -1	76 Os +2,3,4,6,8	77 Ir +2,3,4,6	78 Pt +2,4	79 Au +1,3	80 Hg +1,2	81 Tl 1, +3	82 Pb +2,4	83 Bi +3,5	84 Po +2,4,6	85 At -1 +1,3,5,7	86 Rn 0,2
87 Fr +1	88 Ra +2	89 Ac +3	104 Rf	105 Db	106 Sg	107 Bh	108 Hs	109 Mt	110 Uun	111 Uuu	112 Uub		114 Uuq		116 Uuh		118 Uuo

58 Ce +3,4	59 Pr +3,4	60 Nd +3	61 Pm +3	62 Sm +2,3	63 Eu +2,3	64 Gd +3	65 Tb +3,4	66 Dy +3	67 Ho +3	68 Er +3	69 Tm +2,3	70 Yb +2,3	71 Lu +3
90 Th +4	91 Pa +4,5	92 U +3,4,5,6	93 Np +3,4,5,6	94 Pu +3,4,5,6	95 Am +3,4,5,6	96 Cm +3	97 Bk +3,4	98 Cf	99 Es +3	100 Fm +3	101 Md +3	102 No +2,3	103 Lr +3

Managing Clients with Metal Toxicity



- Protect against damage
  - ***Mineral chelate formula*** – 2 tablets BID
  - ***Multivitamin, mins & phytonutrients***– 1 tablet BID
  - ***Buffered C formula*** – 1-2 tsp BID
  - **Diet: plenty of** deep colored fruits and vegetables

Mineral chelate formula

One tablet supplies:

Vitamin C (as ascorbic acid) ..... 125 mg
Vitamin D (as cholecalciferol) ..... 33 IU
Calcium (as calcium citrate, tricalcium phosphate, MCHC[1]) ..... 83 mg
Iron (as iron glycinate) ..... 7 mg
Phosphorus (as dicalcium phosphate, MCHC[1]) ..... 10 mg
Iodine (as potassium iodide) ..... 50 mcg
Magnesium (as magnesium citrate, magnesium bis-glycinate[1]) ..... 67 mg
Zinc (as zinc citrate) ..... 7 mg
Selenium (as selenium aspartate) ..... 33 mcg
Copper (as copper citrate) ..... 1 mg
Manganese (as manganese citrate) ..... 1 mg
Chromium (as chromium citrate) ..... 30 mcg
Molybdenum (as molybdenum aspartate) ..... 17 mcg
Potassium (as potassium chloride, iodide) ..... 33 mg
Betaine HCl ..... 108 mg
Horsetail 4:7:1 Aerial Part Extract (*Equisetum arvense*) ..... 8.25 mg

Other ingredients: Cellulose, microcrystalline cellulose, stearic acid (vegetable), croscarmellose sodium, magnesium stearate (vegetable), and coating (water, hypromellose, medium chain triglycerides, and hydroxypropylcellulose).

[1]Microcrystalline hydroxyapatite concentrate (MCHC) supplies calcium, phosphorus, and trace quantities of other minerals.
[1]Fully reacted magnesium amino acid chelate; U.S. Patent No. 5,516,925 **Albion®**.

Recommendations: Take one tablet up to three times daily with food or as directed by your healthcare practitioner.

Vitamin C Complex

Serving Size: 1/4 Rounded Teaspoon (1.85 g)
Servings Per Container: Approximately 122
One serving supplies:

Vitamin C (as Ultra Potent-C®) ..... 1088 mg
Niacin (as niacinamide ascorbate) ..... 84 mg
Calcium (as calcium ascorbate) ..... 51 mg
Magnesium (as magnesium ascorbate) ..... 8 mg
Sodium (as sodium ascorbate) ..... 15 mg
Potassium (as potassium ascorbate) ..... 7 mg
Xylitol ..... 192 mg
L-Lysine (as L-lysine HCl) ..... 40 mg
Citrus Bioflavonoid Complex ..... 36 mg
[standardized to 45% (17 mg) full spectrum bioflavonoids]
Tetrasodium Pyrophosphate ..... 16 mg
Alpha-D-Ribofuranose ..... 15 mg
L-Cysteine ..... 11 mg
L-Glutathione ..... 5 mg

Other ingredients: Ultra Potent-C® [calcium ascorbate, niacinamide ascorbate, ascorbic acid, sodium ascorbate, magnesium ascorbate, L-lysine HCl, ascorbyl palmitate, potassium ascorbate, citrus bioflavonoid complex, tetrasodium pyrophosphate, alpha D-ribofuranose, L-cysteine monohydrochloride, xylitol, and L-glutathione].

Recommendations: For best results, mix a rounded 1/4 teaspoon into six ounces of warm water and stir well. Take one serving daily or as directed by your healthcare practitioner.

Multivitamin, mins & phytonutrient

Two tablets or three capsules supply:

Vitamin A ..... 10,000 IU
[50% as mixed carotenoids and 50% as retinyl acetate]
Vitamin C (as ascorbic acid and ascorbyl palmitate) ..... 120 mg
Vitamin D3 (as cholecalciferol) ..... 1000 IU
Vitamin E (as d-alpha tocopheryl succinate) ..... 100 IU
Vitamin K (as phytonadione) ..... 120 mcg
Thiamin (as thiamin mononitrate) ..... 25 mg
Riboflavin ..... 15 mg
Niacin (as niacinamide and niacin) ..... 50 mg
Vitamin B6 (as pyridoxine HCl) ..... 25 mg
Folate (as calcium L-5-methyltetrahydrofolate) ..... 800 mcg
Vitamin B12 (as methylcobalamin ..... 200 mcg
Biotin ..... 500 mcg
Pantothenic Acid (as D-calcium pantothenate) ..... 75 mg
Iodine (as potassium iodide) ..... 150 mcg
Magnesium (as magnesium citrate) ..... 40 mg
Zinc (as zinc citrate) ..... 15 mg
Selenium (as selenium aspartate) ..... 100 mcg
Copper (as copper citrate) ..... 1 mg
Manganese (as manganese citrate) ..... 0.5 mg
Chromium (as chromium polynicotinate) ..... 200 mcg
Molybdenum (as molybdenum aspartate complex) ..... 50 mcg
Choline (as choline bitartrate) ..... 25 mg
Inositol ..... 25 mg
Lycopene ..... 6 mg
Zeaxanthin ..... 2 mg
Lutein ..... 6 mg
Resveratrol (from *Polygonum cuspidatum* root extract) ..... 10 mg
Proprietary Phytonutrient Blend ..... 400 mg
Citrus Bioflavonoid Complex [standardized to 45% hesperidin], green coffee bean extract [standardized to 45% chlorogenic acid], pomegranate whole fruit extract [standardized to 40% ellagic acid], grape seed extract [standardized to 96% polyphenols], blueberry fruit extract [standardized to 25% anthocyanidins], green tea leaf extract [standardized to 50% catechins and 40% EGCG], bitter melon fruit extract [standardized to 5% bitter principles], prune skin extract [standardized to 50% polyphenols], watercress herb 4:1 extract, Chinese cinnamon (Cinnamomum cassia) bark powder, Indian gum Arabic tree bark and heartwood extract [standardized to 8% catechins], rosemary extract [standardized to 11% min phenolic diterpenes and 7.6 % min sum of carnosol+carnosic acid], artichoke leaf extract [standardized to 0.3% cynarins and 1% chlorogenic acid]

Other ingredients (tablets): Microcrystalline cellulose, cellulose, croscarmellose sodium, silica, stearic acid (vegetable), coating (water, hypromellose, medium chain triglycerides, hydroxypropylcellulose, and sodium copper chlorophyllin).

Other ingredients (capsules): Microcrystalline cellulose, capsule (hypromellose, sodium copper chlorophyllin), stearic acid (vegetable), and magnesium stearate (vegetable).

Recommendations: Take one to two tablets or one to three capsules daily with food or as directed by your healthcare practitioner.

Case Study

- Female, 41 yo
- Presented with extreme fatigue & weakness, migraines, uterine fibroids, irregular menses with frequent heavy bleeding, weight gain, vertigo, chronic diarrhea
- Previously tested positive for EBV, negative for mercury
- In-house testing (BCA, HAQ) pointed towards toxicity as an underlying cause

Case Study

Toxic Elements

Element	(µg / g creat.)	Ref Range
Lead	0.40	<= 1.41
Mercury	1.14	<= 6.97
Aluminum	<dl	<= 98.7
Antimony	0.04	<= 0.14
Arsenic	13.9	<= 81.2
Barium	0.82	<= 7.88
Bismuth	0.14	<= 1.16
Cadmium	0.55	<= 0.76
Cesium	4.4	<= 11.3
Gadolinium	<dl	<= 0.037
Gallium	2.92	<= 3.34
Nickel	3.7	<= 9.5
Niobium	<dl	<= 0.075
Platinum	<dl	<= 0.113
Rubidium	1,254	<= 3,036
Thallium	0.08	<= 0.51
Thorium	<dl	<= 0.063
Tin	0.6	<= 3.2
Tungsten	0.04	<= 0.34
Uranium	0.006	<= 0.013

Toxic Elements

Element	(µg / 24 hour)	Ref Range
Lead	1.77	<= 1.49
Mercury	9.15	<= 4.72
Aluminum	<dl	<= 88.1
Antimony	0.20	<= 0.21
Arsenic	286.5	<= 82.3
Barium	5	<= 11
Bismuth	0.53	<= 0.87
Cadmium	2.40	<= 0.69
Cesium	16.6	<= 12.5
Gadolinium	<dl	<= 0.033
Gallium	11.9	<= 6.7
Nickel	37.8	<= 14.8
Niobium	<dl	<= 0.050
Platinum	<dl	<= 0.087
Rubidium	4,909	<= 2,701
Thallium	0.25	<= 0.51
Thorium	<dl	<= 0.048
Tin	2.1	<= 4.1
Tungsten	0.10	<= 0.44
Uranium	0.035	<= 0.017

Supplement Recommendations

Remedy/Supplement	Upon rising	Breakfast	Mid – morning	Lunch	Mid – afternoon	Dinner	Before retiring
Endefen – in 4-6 oz liquid, then 12 oz water	1 Tbsp				1 Tbsp		
UltraClear Plus pH – as directed							
AdvaClear – as directed							
Ultra Potent C – 1 heaping tsp in each serving UltraClear Plus pH							
Phyto-Multi		1				1	
Multi-Min Chelate		2				2	
Nutri-DMSA – 2 caps b4 bed for 1 month, then 3 caps before bed for 2 months, then 4 caps before bed for 1 month							2-4

- Dry skin brushing – 1-2x daily
- CHEW your food at LEAST 30 times (it should be liquid☺) before swallowing.
- Water – drink 2.5 quarts of water/tea daily in divided doses (4 oz. (1/2 cup) every 30 minutes optimal)
- Green or Rooibos tea – 5 cups daily

Case study: Six months later

Toxic Elements

Element	(µg / g creat.)	Ref Range
Lead	0.50	<= 1.41
Mercury	1.32	<= 6.97
Aluminum	12.9	<= 98.7
Antimony	0.04	<= 0.14
Arsenic	25.7	<= 81.2
Barium	2.65	<= 7.88
Bismuth	<dl	<= 1.16
Cadmium	0.41	<= 0.76
Cesium	4.4	<= 11.3
Gallium	3.56	<= 3.34
Nickel	5.5	<= 9.5
Niobium	<dl	<= 0.075
Platinum	<dl	<= 0.113
Rubidium	1,358	<= 3,036
Thallium	0.13	<= 0.51
Thorium	<dl	<= 0.063
Tin	0.7	<= 3.2
Tungsten	0.59	<= 0.34
Uranium	0.007	<= 0.013

Toxic Elements

Element	(µg / g creat.)	Ref Range
Lead	<0.52	<= 1.41
Mercury	1.34	<= 6.97
Aluminum	20.8	<= 98.7
Antimony	0.05	<= 0.14
Arsenic	20.3	<= 81.2
Barium	1.83	<= 7.88
Bismuth	<dl	<= 1.16
Cadmium	0.51	<= 0.76
Cesium	5.2	<= 11.3
Gallium	4.12	<= 3.34
Nickel	5.1	<= 9.5
Niobium	<dl	<= 0.075
Platinum	0.017	<= 0.113
Rubidium	1,431	<= 3,036
Thallium	0.16	<= 0.51
Thorium	<dl	<= 0.063
Tin	0.8	<= 3.2
Tungsten	0.10	<= 0.34
Uranium	0.008	<= 0.013

Reference Ranges Information

Case study: Six months later

Toxic Elements

Element	(µg / 24 hour)	Ref Range
Lead	1.77	<= 1.49
Mercury	9.15	<= 4.72
Aluminum	<dl	<= 88.1
Antimony	0.20	<= 0.21
Arsenic	286.5	<= 82.3
Barium	5	<= 11
Bismuth	0.53	<= 0.87
Cadmium	2.40	<= 0.69
Cesium	16.6	<= 12.5
Gadolinium	<dl	<= 0.033
Gallium	11.9	<= 6.7
Nickel	37.8	<= 14.8
Niobium	<dl	<= 0.050
Platinum	<dl	<= 0.087
Rubidium	4,969	<= 2,701
Thallium	0.25	<= 0.51
Thorium	<dl	<= 0.048
Tin	2.1	<= 4.1
Tungsten	0.10	<= 0.44
Uranium	0.035	<= 0.017

Toxic Elements

Element	(µg / g creat.)	Ref Range
Lead	<0.52	<= 1.41
Mercury	1.34	<= 6.97
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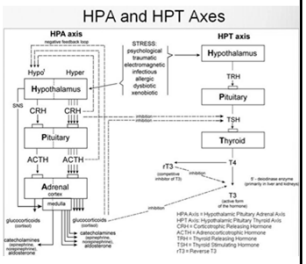
Tin	0.8	<= 3.2
Tungsten	0.10	<= 0.34
Uranium	0.008	<= 0.013

Toxic Element Clearance Profile

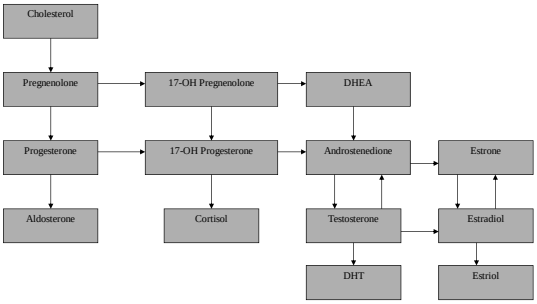
- Best for:
  - Identifying heavy metal exposure/storage
    - Suspect if poor detoxification and/or symptoms of exposure
- Ideally do both pre- and post- provocation (chelation)
  - Pre-chelation – indicates recent exposure
  - Post-chelation – measure of total-body burden (stored)
  - Can compare the two to evaluate exposure and guide recommendations
- Do 24-hr collection expressed as amount/mg creatinine

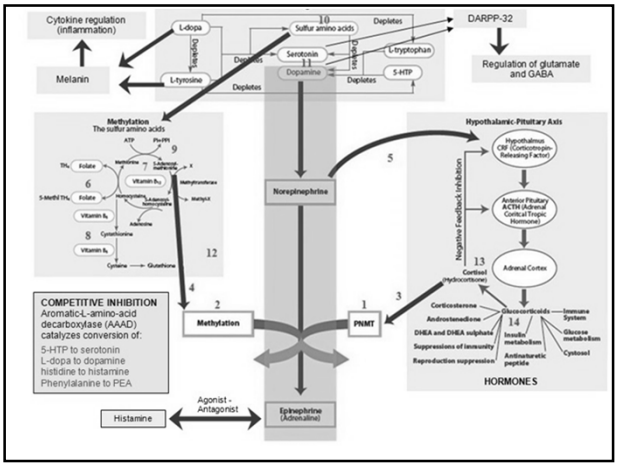
Chronic Stress Threatens our Health

- Chronic stress disrupts adrenal & thyroid function
  - Nearly 4 in 5 U.S. adults regularly experience physical symptoms associated with stress
  - Over 7 in 10 American adults commonly suffer stress-related psychological symptoms
  - Almost 1 in 2 adults in the U.S. report lying awake at night due to stress
  - Nearly 1 in 2 report that stress has had a negative impact personally and professionally



Steroid Hormone Principle Pathways





Associated Symptoms

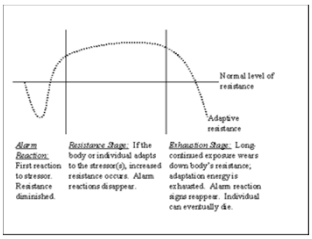
- Pain/spasm in upper back & neck muscles
- Loss of libido
- Poor memory
- Light headed when standing
- Headaches
- Irritability/moodiness
- Alcohol intolerance
- Tenderness in low back
- Dry/thin skin
- Scanty perspiration
- Slow wound healing
- Cold intolerance
- Weakness
- Nervous/anxious
- Chronic inflammation
- Palpitations
- Weight gain
- Low blood pressure
- Sweet/salt cravings
- Unexplained hair loss
- Muscle wasting
- Poor concentration
- Frustration/confusion
- Low body temps
- Slow recovery from work outs

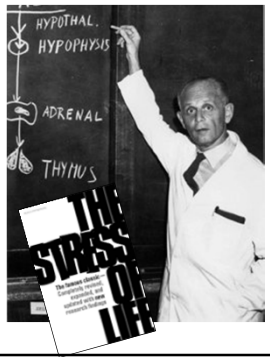
Associated Conditions

- Anxiety
- Depression
- Fibromyalgia
- PMS
- Insomnia
- Migraines
- Infertility
- Severe menopause
- Asthma
- Allergies
- Ulcers
- Cardiovascular disease
- High blood pressure
- Thyroid Dysfunction
- Celiac disease
- Osteoporosis
- Depression
- Chronic Fatigue
- Immune dysfunction
- Hypothyroidism
- Obesity
- Hypoglycemia

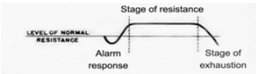
Defining Stress and Adrenal Fatigue

General Adaptation Syndrome (G.A.S)

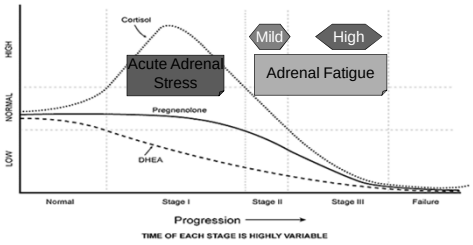




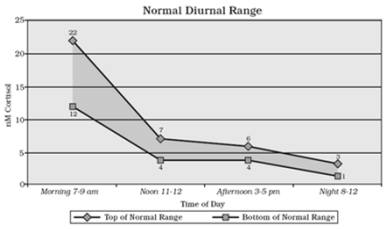
Stages of Adrenal Fatigue



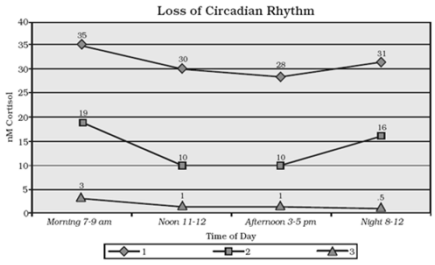
Progression of Stages of Adrenal Exhaustion



Normal Diurnal Range



Abnormal Cortisol Rhythm

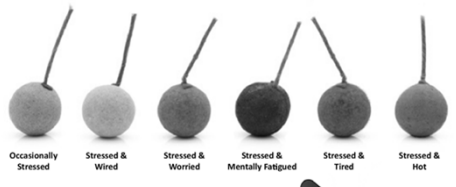


Does your patient have Adrenal Fatigue?

- Go through the Classic Signs
- Use Identi-T Stress Assessment
- HAQ:
  - Section III: Adrenal and Thyroid
  - Section IV: Glucose Regulation
  - Section VI: Mood
  - Section VII: Immune
  - Section XII: Female

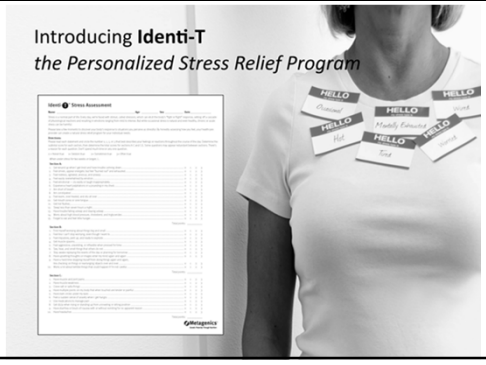
Identify the Stress Experience

Stress relief begins with identifying your unique experience to stressors.



Stress patterns express a trend toward increasing exposure to excess stress hormones and decreasing stressor tolerance.

Identi-T Stress Assessment



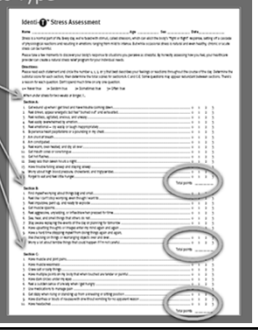
Identi-T Stress Assessment

- Provides information on 3 layers of stress response:
  1. The intensity of perceived stress
  2. HPA over- or under-responsiveness to stressors
  3. The relationship between stress type and the appropriate nutraceuticals and lifestyle support

Identi-T Stress Assessment

Step 1: Identifying Stress Type

- **Add up the points in each Section – A through E**
  - Section A: Wired
  - Section B: Worried
  - Section C: Adrenal cortisol
  - Section D: Mental fatigue
  - Section E: Tired

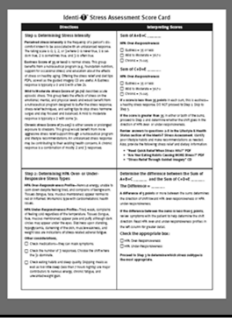


Identi-T Stress Assessment

Interpreting Identi-T Scores & Protocols

The Flow…

- Transfer individual Section and Sum scores to the Score Card
- Determine stress intensity
- Determine HPA Over- or Under-responsiveness
- Determine Stress Type within HPA path chosen
- Check adrenal function
- Check sleep questions
- Eustress recommendations
- Protocols

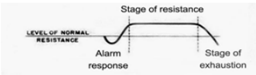


Assessment of Adrenal Function

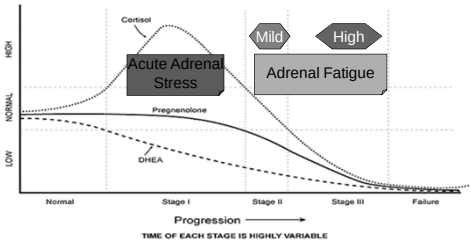
- Serum, saliva, or urine
- Serum: Protein bound vs. free fraction
- Salivary: Diurnal rhythm of Cortisol

- Salivary free-fraction best option:
  - Correlated with serum free fraction
  - Measures bioavailable hormone
  - Easy at home collections throughout day/nigh month
  - Economical
- ➢ Adrenal Stress Profile

Stages of Adrenal Fatigue



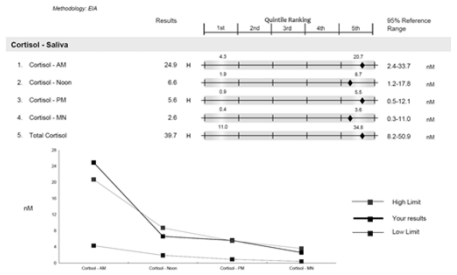
Progression of Stages of Adrenal Exhaustion



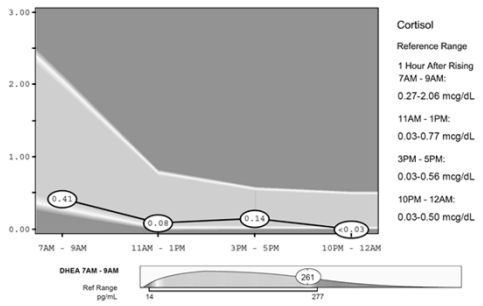
Stages of Adrenal Fatigue

Stage of adrenal fatigue	Cortisol Levels	DHEA Levels	Average time to recovery	Preferred Interventions
I: Acute Adrenal Fatigue	• At least one cortisol level is high • Total cortisol sum is high	• DHEA is borderline low, low or normal	• 1-6 months	• Lifestyle & dietary changes • Supplementation PRN
II: Mild Adrenal Fatigue	• AM, noon or afternoon cortisol is low or borderline low • Total cortisol sum is normal	• DHEA is normal or borderline low	• 6-12 months	• Adrenal Support Supplementation • Targeted Lifestyle and dietary changes
III: High Adrenal Fatigue	• Most cortisol levels are low or borderline low • Total cortisol level is low	• DHEA levels are normal, borderline low or low	• 12-24 months	• Adrenal, Neurotransmitter and/or Hormone Supplementation • Immediate lifestyle and dietary changes
IV: Adrenal Failure	• All cortisol levels are low or borderline low • Total cortisol is low	• DHEA level is low	• 18-36 months	• Hospitalization/medical attention • Adrenal, Neurotransmitter and/or Hormone Supplementation • Immediate lifestyle and dietary changes

Adrenal Stress Profile: Case Study #1



Adrenal Stress Profile: Case Study #2



Organix Profile

- Organic acid testing
  - Way to measure whether the body is getting and using nutrients to drive optimal health
  - Can alert to metabolic imbalances

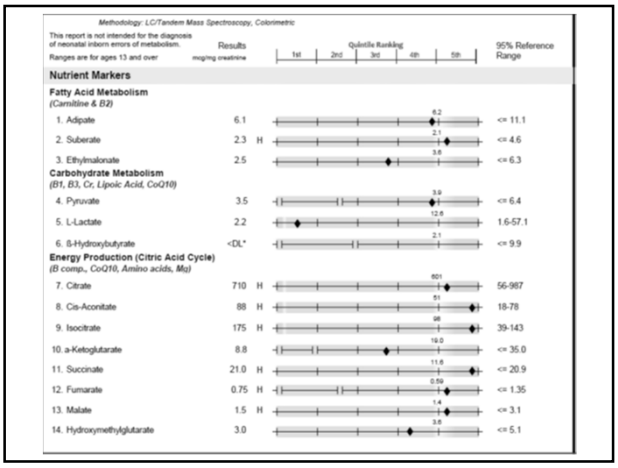
Organix Basic Test
• All B-vitamins (including methylation cofactors)
• Fatty acid metabolism
• Carbohydrate metabolism
• Nutrients involved in cellular energy production (Citric acid cycle)
• Neurotransmitter metabolism
• Nutrients involved in detoxification
• Antioxidant status

Organix Comprehensive Test
• All markers in Organix Basic
• Markers of intestinal microbial activity
• Marker of cellular DNA damage (8-Hydroxy-2-deoxyguanosine)

Organix Profile

- Useful anytime looking for root nutritional imbalances
- Simple, at home urine collection
- Comes with Interpretation and Patient Guides
- Can be combined with Fatty Acid Bloodspot

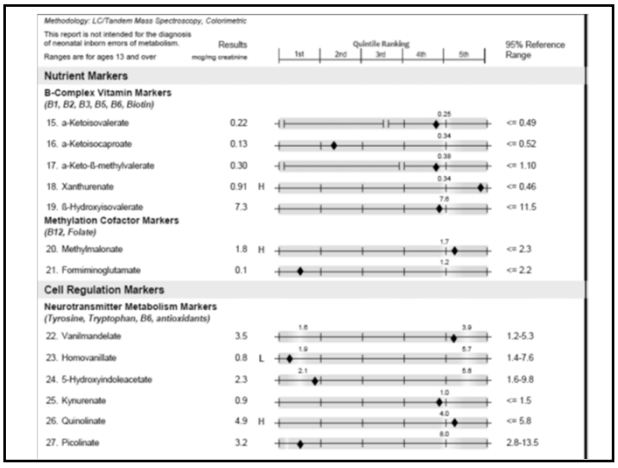
Anxiety/Depression	GI imbalances	Autoimmune disorders
Bloating and gas	Hypertension	Attention and memory disorders
Weight loss issues	Dermatitis	Ear, nose & throat symptoms
Mood imbalances	Headaches	Blood sugar dysregulation
Detoxification imbalances	Fatigue	Multiple chemical sensitivities
Muscle and joint pain	Sleep issues	Mental, emotional & behavioral problems



Methodology: LC/Tandem Mass Spectroscopy, Colorimetric

This report is not intended for the diagnosis of neonatal inborn errors of metabolism.
Ranges are for ages 13 and over

	Results mcg/mg creatinine		Quintile Ranking (1st, 2nd, 3rd, 4th, 5th)	95% Reference Range
Nutrient Markers				
Fatty Acid Metabolism *(Carnitine & B2)*				
1. Adipate	6.1		6.2	<= 11.1
2. Suberate	2.3	H	2.1	<= 4.6
3. Ethylmalonate	2.5		3.6	<= 6.3
Carbohydrate Metabolism *(B1, B3, Cr, Lipoic Acid, CoQ10)*				
4. Pyruvate	3.5		3.9	<= 6.4
5. L-Lactate	2.2		12.6	1.6-57.1
6. ß-Hydroxybutyrate	<DL*		2.1	<= 9.9
Energy Production (Citric Acid Cycle) *(B comp., CoQ10, Amino acids, Mg)*				
7. Citrate	710	H	601	56-987
8. Cis-Aconitate	88	H	51	18-78
9. Isocitrate	175	H	98	39-143
10. a-Ketoglutarate	8.8		19.0	<= 35.0
11. Succinate	21.0	H	11.6	<= 20.9
12. Fumarate	0.75	H	0.59	<= 1.35
13. Malate	1.5	H	1.4	<= 3.1
14. Hydroxymethylglutarate	3.0		3.6	<= 5.1



Methodology: LC/Tandem Mass Spectroscopy, Colorimetric

This report is not intended for the diagnosis of neonatal inborn errors of metabolism.
Ranges are for ages 13 and over

	Results mcg/mg creatinine		Quintile Ranking (1st, 2nd, 3rd, 4th, 5th)	95% Reference Range
Nutrient Markers				
B-Complex Vitamin Markers *(B1, B2, B3, B5, B6, Biotin)*				
15. a-Ketoisovalerate	0.22		0.25	<= 0.49
16. a-Ketoisocaproate	0.13		0.34	<= 0.52
17. a-Keto-ß-methylvalerate	0.30		0.38	<= 1.10
18. Xanthurenate	0.91	H	0.34	<= 0.46
19. ß-Hydroxyisovalerate	7.3		7.6	<= 11.5
Methylation Cofactor Markers *(B12, Folate)*				
20. Methylmalonate	1.8	H	1.7	<= 2.3
21. Formiminoglutamate	0.1		1.2	<= 2.2
Cell Regulation Markers				
Neurotransmitter Metabolism Markers *(Tyrosine, Tryptophan, B6, antioxidants)*				
22. Vanilmandelate	3.5		1.6 / 3.9	1.2-5.3
23. Homovanillate	0.8	L	1.9 / 5.7	1.4-7.6
24. 5-Hydroxyindoleacetate	2.3		2.1 / 5.8	1.6-9.8
25. Kynurenate	0.9		1.0	<= 1.5
26. Quinolinate	4.9	H	4.0	<= 5.8
27. Picolinate	3.2		8.0	2.8-13.5

Methodology: LC/Tandem Mass Spectroscopy, Colorimetric

This report is not intended for the diagnosis of neonatal inborn errors of metabolism.
Ranges are for ages 13 and over

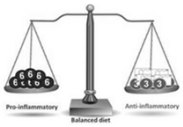
	Results mcg/mg creatinine		Quintile Ranking (1st, 2nd, 3rd, 4th, 5th)	95% Reference Range
Toxicants and Detoxification				
Detoxification Indicators *(Arg, NAC, Met, Mg, antioxidants)*				
28. 2-Methylhippurate	0.088	H	0.084	<= 0.192
29. Orotate	0.55		0.59	<= 1.01
30. Glucarate	10.1	H	6.3	<= 10.7
31. a-Hydroxybutyrate	0.2		0.3	<= 0.9
32. Pyroglutamate	41		59	28-88

Table 1 – Summary of Abnormalities for Organic Acids in Urine

Name		Potential Intervention	Metabolic Pathway	
Fatty Acid Oxidation				
Adipate	H	L-Carnitine, 500–1000 mg TID; L-Lysine (if low), 500 mg TID; B2, 100mg BID	Fatty acid oxidation	
Suberate	H			
Ethylmalonate	H	See text for other interventions in genetic disorders		
Carbohydrate Metabolism				
Pyruvate	H	B_1, up to 100mg TID with B complex support; For concurrent H Lactate: lipoic acid, 500mg TID	Aerobic/anaerobic energy production	
Lactate	H	Coenzyme Q_{10}, 50 mg TID		
β-Hydroxybutyrate	H	Chromium picolinate, 200 µg BID	Balance of fat and CHO metabolism	
Energy Production (Citric Acid Cycle)				
Citrate	H	Arginine, 1–3 gm/day	Citric Acid Cycle Intermediates	Renal ammonia clearance
	L	Aspartic acid, 500 mg; magnesium citrate, 500 mg		
Cis-aconitate	H	Cysteine, 1000 mg BID; Check for iron deficiency		
Isocitrate	H	Lipoic acid, 25 mg/kg/day Magnesium, 400 mg; manganese, 20 mg		
α-Ketoglutarate	H	B-complex, 1 TID; lipoic acid 100 mg		
Succinate	H	CoQ_{10}, 50 mg TID, magnesium, 500 mg		
Fumarate	H	CoQ_{10}, 50 mg TID, magnesium, 500 mg		
Malate	H	CoQ_{10}, 50 mg TID, B_6, 100 mg TID		
Hydroxymethylglutarate	L,H	CoQ_{10}, 50 mg TID	(L) Substrate-limited CoQ_{10} synthesis (H) HMG-CoA reductase inhibition	

Fatty Acid Bloodspot

- Identifies imbalances with omega-3 and omega-6 fatty acids
  - Inflammation, free radical production, immune function
- Also measure trans-fatty acids
- Easy to implement in any practice
- Simple finger stick, can be done at home
- Cost-effective



Bloodspot FATTY ACIDS

0241 Bloodspot Fatty Acids Profile

Methodology: Capillary Gas Chromatography/Mass Spectroscopy

Ranges are for ages 13 and over

	Results Area %		Quintile Ranking 1st / 2nd / 3rd / 4th / 5th	95% Reference Range
Polyunsaturated Omega-3				
1. Alpha Linolenic (ALA) (18:3n3)	0.36		0.17	0.10-0.54
2. Eicosapentaenoic (EPA) (20:5n3)	0.90		0.15	0.08-1.55
3. Docosahexaenoic (DHA) (22:6n3)	0.58	L	0.68	0.33-2.51
Polyunsaturated Omega-6				
4. Linoleic (LA) (18:2n6)	10.7	L	11.5 / 16.9	10.3-18.6
5. Gamma Linolenic (GLA) (18:3n6)	0.05		0.04 / 0.18	0.03-0.24
6. Dihomogamma Linolenic (DGLA) (20:3n6)	0.68		0.39 / 0.88	0.30-1.08
7. Arachidonic (AA) (20:4n6)	3.2		3.0 / 6.5	2.2-7.5
Trans				
8. Total C:18 Trans Fatty Acids	0.31		0.42	<= 0.69
Ratios				
9. LA/GLA (Desaturation efficiency)	198		252	54-532
10. AA/EPA (Eicosanoid Series 2/3)†	3.5		31.8	2.6-61.6
11. EPA/DGLA (Eicosanoid Series 3/1)	1.32		0.23	0.11-3.42
12. Index of Omega-3 Fatty Acids (EPA + DHA%)‡	1.48	L	1.56	> 0.45

Fatty Acid Bloodspot: Case Study #1

Ranges are for ages 13 and over

	Results % Total Area		Quintile Ranking 1st / 2nd / 3rd / 4th / 5th	95% Reference Interval
Polyunsaturated Omega-3				
1 Eicosapentaenoic (EPA) (20:5n3)	0.71		0.15	0.08-1.55
2 Docosahexaenoic (DHA) (22:6n3)	1.11		0.68	0.33-2.51
Polyunsaturated Omega-6				
3 Linoleic (LA) (18:2n6)	16.9		11.5 / 16.9	10.3-18.6
4 Gamma Linolenic (GLA) (18:3n6)	0.05		0.04 / 0.18	0.03-0.24
5 Dihomogamma Linolenic (DGLA) (20:3n6)	0.40		0.39 / 0.88	0.30-1.08
6 Arachidonic (AA) (20:4n6)	2.9	L	3.0 / 6.5	2.2-7.5
Trans				
7 Total C:18 Trans Fatty Acids	0.17		0.42	<= 0.69
Ratios				
8 LA/GLA (Desaturation efficiency)	315	H	252	54-532
9 AA/EPA (Eicosanoid Series 2/3)†	4.1		31.8	2.6-61.6
10 EPA/DGLA (Eicosanoid Series 3/1)	1.75		0.23	0.11-3.42
11 Index of Omega-3 Fatty Acids (EPA + DHA%)‡	1.82		1.56	> 0.45

Fatty Acid Bloodspot: Case Study #2

Ranges are for ages 13 and over

	Results % Total Area		Quintile Ranking 1st / 2nd / 3rd / 4th / 5th	95% Reference Interval
Polyunsaturated Omega-3				
1 Eicosapentaenoic (EPA) (20:5n3)	0.22		0.15	0.08-1.55
2 Docosahexaenoic (DHA) (22:6n3)	0.86		0.68	0.33-2.51
Polyunsaturated Omega-6				
3 Linoleic (LA) (18:2n6)	14.5		11.5 / 16.9	10.3-18.6
4 Gamma Linolenic (GLA) (18:3n6)	0.19	H	0.04 / 0.18	0.03-0.24
5 Dihomogamma Linolenic (DGLA) (20:3n6)	1.07	H	0.39 / 0.88	0.30-1.08
6 Arachidonic (AA) (20:4n6)	5.2		3.0 / 6.5	2.2-7.5
Trans				
7 Total C:18 Trans Fatty Acids	0.54	H	0.42	<= 0.69
Ratios				
8 LA/GLA (Desaturation efficiency)	76		252	54-532
9 AA/EPA (Eicosanoid Series 2/3)†	23.5		31.8	2.6-61.6
10 EPA/DGLA (Eicosanoid Series 3/1)	0.20	L	0.23	0.11-3.42
11 Index of Omega-3 Fatty Acids (EPA + DHA%)‡	1.08	L	1.56	> 0.45

Genova/Metametrix Account Set-Up

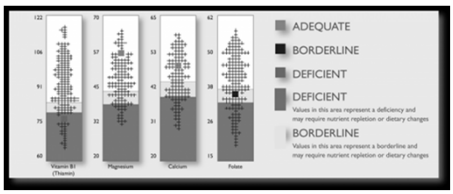
- Contact: Client Services: 800-522-4762
- OR website: www.gdx.net
  - Go to Getting Started box OR
  - https://www.gdx.net/customer-support/client-info-form
- Code: OLERSEMINAR
  - Ask for educational & personal testing options

Micronutrient Test

- Assesses intracellular requirements of micronutrients
  - Measure lymphocyte response to nutrients
  - Accurate long-term measurement of nutrient status
- Assesses your cells ability to resist damage caused by free radicals/oxidative stress (Spectrox Score)
- Provide overall assessment of immune function (Immunidex Score)
- Requires a blood draw; they have draw sites available

Interpreting the Results

- Report easy to read/understand
  - Includes explanation of any deficiencies, symptoms, food sources and toxicity information
- Can indicate if taking too much of a nutrient



Micronutrient Test

VITAMINS
Vitamin A
Vitamin B1
Vitamin B2
Vitamin B3
Vitamin B6
Vitamin B12
Biotin
Folate
Pantothenate
Vitamin C
Vitamin D
Vitamin K

MINERALS
Calcium
Magnesium
Manganese
Zinc
Copper

AMINO ACIDS
Asparagine
Glutamine
Serine

ANTIOXIDANTS
Alpha Lipoic Acid
Coenzyme Q10
Cysteine
Glutathione
Selenium
Vitamin E

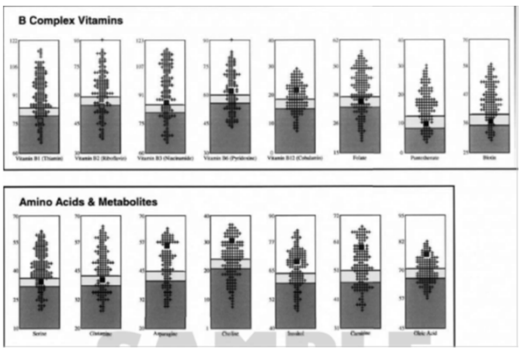
SPECTROX™
for Total
Antioxidant Function

IMMUNIDEX™
Immune Response Score

CARBOHYDRATE METABOLISM
Chromium
Fructose Sensitivity
Glucose-Insulin Metabolism

FATTY ACIDS
Oleic Acid

METABOLITES
Choline
Inositol
Carnitine

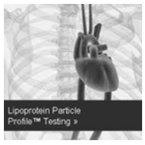


Micronutrient Test

- When to use:
  - If looking for specific nutritional deficiencies
  - Supplement dosing modifications
  - Comprehensive antioxidant assessment

SpectraCell Account Set-Up

- Contact: Chris Nordeen
- cnordeen@spectracell.com
- 612-250-9105
  - Micronutrient Testing
  - Lipoprotein Particle Testing
    - LPP+



Hypersensitivity – Food/Environmental

- May be very important to identify and remove in many disorders

- Fatigue/Lethargy
- Gastrointestinal disorders
- Asthma
- Joint pain / Arthritis
- Eczema / Psoriasis
- Acne / Rosacea
- Skin rashes
- Headaches/Migraines
- ADD and/or Hyperactivity
- Mood disorders/moodiness
- Brain fog / memory issues
- Food cravings
- Dark circles under the eyes
- Congestion
- Sinus problems
- Inability to lose weight
- Recurrent infections
- Chronic throat clearing
- Autoimmune conditions
- Detoxification imbalance

Immune System = Defender & Mechanic

- Immune system = Defender and Mechanic
  - Identifies, neutralizes and eliminates foreign substances
  - Responsible for repair of the body
- When repair deficits accumulate ⟶ inflammation
  - When chronic ⟶ Immune dysfunction & autoimmunity
- A healthy immune system is very tolerant
- When immune dysfunction occurs, the body inappropriately reacts to many substances

Tests of Immune System Response

- Tests of classic allergy
  - Measure IgE by RAST or skin prick tests
  - Type 1 hypersensitivity (immediate hypersensitivity)
- Tests of hypersensitivity
  - Measure delayed immune responses
    - Reactive antibodies (i.e., IgM, IgG)
    - Immune complexes
    - T-cell mediated responses
- Intolerance
  - Non-immune reactions
    - Enzyme deficiency, histamine/tyramine-rich foods, food additives/preservatives, colors, MSG, artificial sweeteners, etc.

Hypersensitivity Tests: All are NOT Equal

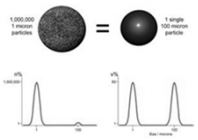
- Serum Tests of Immune System Memory
- Particle Size Tests
- Functional Immune System Assays

Serum Tests of Immune System Memory

- Measure the presence of a substance
  - Typically IgG antibody/subtype (IgG4)
  - Reveals if immune system mounted a response at some time in the past
- Antibodies may protect the body or provoke reactions
  - IgG tests do NOT distinguish helpful neutralizing antibodies from harmful reactive antibodies
    - May identify foods that are not harmful
    - Be unnecessarily restrictive
  - IgG antibodies cover ~70% of delayed hypersensitivities
- Examples: ELISA, IgG, IgG EIA

Particle Size Tests

- Measure particles of a specific size (10 µm)
  - Reactive Lymphocytes
  - Clumps of platelets
  - Stacks of RBC (rouleaux)
  - Granulocytes remnants
  - ➢ Decreased accuracy
  - ➢ Unnecessarily restrictive
- Examples: ALCAT & SAGE



Functional Immune System Assays

- Lymphocyte Response Assays (LRA)
- Measure full range of delayed immune responses
  - Reactive antibodies (IgA, IgM, IgG)
  - Immune complexes
  - Direct T-cell responses
  - ➢ Most accurate and clinically relevant
- Examples: LRA (Elisa/Act Biotechnologies)

Food Hypersensitivity Testing Summary

- Lymphocyte Response Assay (LRA) by Elisa/Act Biotechnologies
  - Most comprehensive & clinically relevant
  - Measures all hypersensitivity pathways with high precision
  - Requires a blood draw (remote draw option)
  - www.elisaact.com ELISA/ACT BIOTECHNOLOGIES
- If blood draw not possible/desired:
  - IgG4 Bloodstick Test - Metametrix

LRA Ordering Information

- Contact: Melissa Crispell
- Mcrispell@ELISAACT.com
- 703-840-4433
- Give code: OLERSEMINAR
  - Get 10% off all tests submitted before April 30
  - Ask about Professional Courtesy Discounts

Testing Priority

- Client needs/wants
- Existing Data
- Insurance coverage
- Financial constraints
- General➔ Specific
  - Primary concern
  - Underlying cause

Getting Testing Done

- Have functional test kits on hand
  - Can also order PRN
- Getting set up with a lab/running labs
  - Quest Diagnostics
  - LabCorp

In-House Testing

- Vitals
- Physical Exam
- Measurements
- BIA
- Zinc Tally
- Iodine stain
- Urine dip stick

Test, Don't Guess

- Give EVERYBODY a HAQ/HH/Detox form
  - Have a staff member total and graph
- In-house testing – can be very useful to get valuable information at low cost to patient
  - BIA, BCA, Zinc Tally, Ht, Wt, urine dip stick, etc.
- Functional testing
  - Have test kits on hand or order/send PRN
- Lab work – do yourself or connect with labs
  - Request medical records PRN

Functional Testing Guidelines

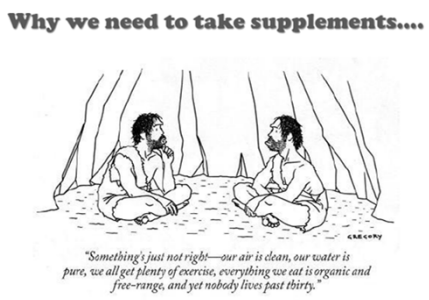
- Cellular energy production
  - Organix Profile (basic or comprehensive)
  - Adrenocortex Profile
- Detoxification function
  - Organix Profile (comprehensive)
  - Toxic Element Clearance profile
- GI Function/imbalances
  - CDSA 2.0 w/ Parasitology
  - Organix Profile (comprehensive)

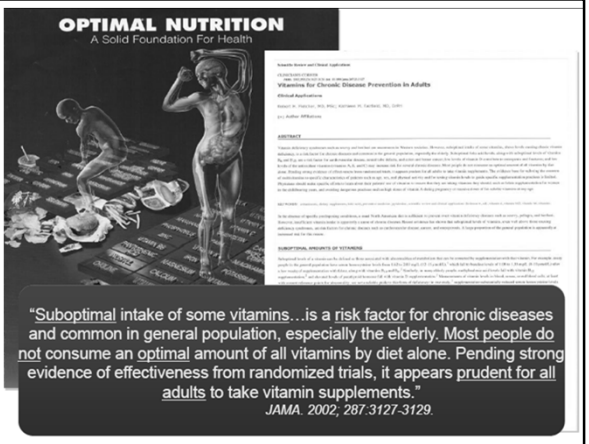
Functional Testing Guidelines

- Nutritional Status
  - Micronutrient Test
  - Organix Profile (basic)
  - Fatty acid bloodspot – EFA balance/inflammation
- Cardiovascular risk
  - LPP+
- Food/environmental hypersensitivity
  - Lymphocyte Response Assay (LRA)

Questions on Testing??

Supplements





Diet may not be enough

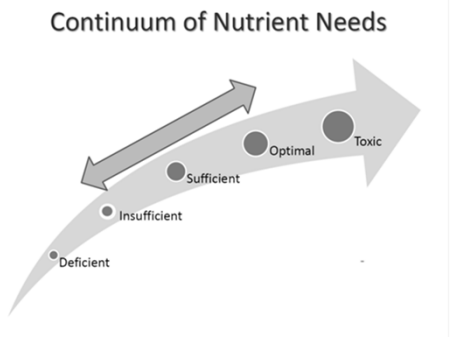
- Soil depletion -> less nutrients in food
- Conditional need
  - "Food is too weak to replete depleted cells & bodies."

Advances in Therapy, Vo. 24 (5), September 2007

Why Can't I Get What I Need from Food?

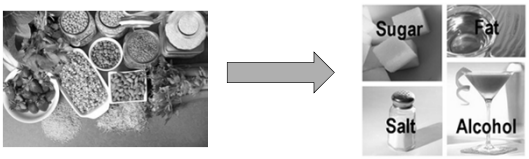
- Nutritional deficiency
- Increased need
- Improper proportions
- Impractical

The Need for Supplementation



Really SAD Diet

- 92% do not eat enough vegetables
- 93% do not eat enough legumes
- 96% do not eat enough whole grains
- Over 90% over-consume solid fats, added sugars and alcoholic beverages



Sad SAD Diet

- 45% do not eat ANY fruit or fruit juice
- 22% do not eat ANY vegetables
- ¼ of all vegetables consumed = French fries
- 20-25% of Americans eat fast food/day
- 70% of all foods consumed are highly processed
- Average only 2-3 servings vegetables/day

Sad SAD Diet

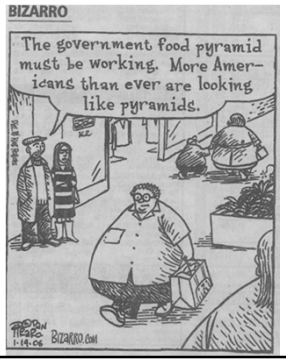
- Most Americans eat foods that will kill them and avoid foods that will help them thrive

The NEED for Supplementation

"Nearly the entire U.S. population consumes a diet that is not on par with recommendations" – conclusion of a report published online on August 11, 2010 in the Journal of Nutrition.

J Nutr. 2010 Aug;140(8):1529-34

USDA Food Pyramid



Supplementation for Optimal Health

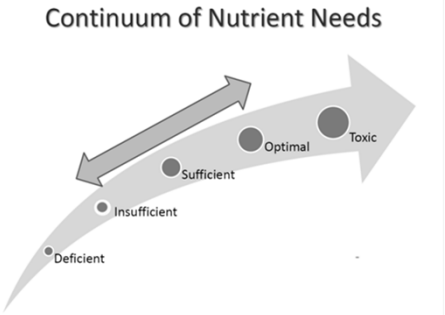
"The RDA (U.S. Government Recommended Daily Allowance) is the nutritional equivalent of the minimum wage."
- Joel Evans, MD, The Center for Women's Health

Supplementation for Optimal Health

"**Only supplementation was able to significantly boost nutrient levels** and confer beneficial effects on general welfare, physical performance, and resistance to infections. Therefore, it appears that **nutritional supplements are advisable for everyone**."

Advances in Therapy, Vol. 24(5), September 2007.

Supplementation for Optimal Health



The Need for Supplementation

"**96% of primary care physicians** believe the nation's healthcare system should place **more emphasis on nutrition to treat and manage chronic disease**."

The role of Nutrition in the Treatment and Management of Chronic Disease: A survey among primary care physicians. Conducted by Hart Research Associates, June 2009.

Supplement Quality

- Is it really in the bottle?

Supplement Quality Studies

- Pharmacy School at U of Maryland
  - 32 bottles of Chondroitin Sulfate from pharmacies and health food stores
    - Only 2 met label claims
    - 14 contained 10% or less of label claim
- Board of Nutrition – Palmer Chiropractic College
  - Evaluated 51 antioxidant products
    - <30% of all label claims met
    - 7 products showed NO antioxidant activity at all

Documented Quality Control Issues

- Inaccurate label claims of herbal products. *Monmaney T. Labels' potency claims often inaccurate, analysis finds. Los Angeles Times, August 31, 1998.*
- Lactobacillus products mislabeled and contaminated. *Hughes, et al. Microbiologic characteristics of Lactobacillus products used for colonization of the vagina. Obstet Gyneocol 1990;75:244.*
- Herbs seriously contaminated with heavy metals and pathogens. *Bateman, J. Possible toxicity of herbal remedies. Scottish Med J 1998;4:7-15.*
- Calcium supplements contaminated with lead. *Bourgoin B, et al. Lead Content in 70 Brands of Dietary Calcium Supplements. Amer J Pub.Hlth. August 1993, Vol. 83, No.8*
- Herbal weight loss products cause lethal side effects because of being tainted with dangerous drugs. *August 2002, Media Inquiries: 301-827-6242*
- Herbs contaminated with mold. *Halt M. Moulds and mycotoxins in herb tea and medicinal plants. Eur J Epidemiology 1998;14:269-74*
- Liver failure and serious liver injury occur with herbs contaminated with drugs. *U. S. Food and Drug Administration Center for Food Safety and Applied Nutrition Office of Nutritional Products, Labeling, and Dietary Supplements November 19, 2001*
- .....

Supplement Quality

- Is it really in the bottle?
- Efficacy matters!
- Insuring the highest quality
  - Scientifically validated raw materials
  - GMP certified manufacturing
  - Human clinical evaluations on THEIR products
  - Quality control and scientific staff

The most expensive product is the one that doesn't work!

Supplements: What to Ask For

- Certificate of Analysis for raw materials and finished product
  - Independent third party lab assay
    - Quantity
    - Potency
    - Contamination
      - Heavy metals
      - PCB's (Polychlorinated Biphenyls)
      - Molds
      - Microbes
      - solvent residue, pesticides and herbicides
    - "Spiked"
      - Pharmaceuticals
    - Hormones

Supplements: What to Look For

- Synthetic vs Natural
  - Synthetic may be defined as a nutrient who's chemical structure is different than what is found in nature, or different than what the body uses from the natural sources
  - Vitamin E
    - Natural: d-alpha tocopherol, and mixed tochopherols
    - Synthetic: dl-tochopherols (derived from petroleum products)
  - Vitamin D
    - Natural: Vitamin D_3 (cholecalciferol)
    - Synthetic: Vitamin D2 (ergocalciferol)

Supplements: What to Look For

- Synthetic vs Natural
  - Synthetic may be defined as a nutrient chemically produced versus derived from a natural source
    - Petroleum and coal tar are also carbon atoms commonly used to reconstruct vitamin molecules chemically.
      - Vitamin E ('dl-' form)
      - B-vitamins
    - Natural forms would include B vitamins from brewers yeast, vitamin E from vegetable oils, B12 from liver, choline and inositol from soy beans.

Supplements: What to Look For

- Processing procedure
  - Look for "fillers" such as lactose, sucrose, hydrated aluminum silicate (talc), modified corn starch, sodium chloride, or sand.
  - Non-medical ingredients called "excipients" include binders, lubricants, and disintegrators might include, soap, rancid oils, shellac, tree sap, polyethylene glycol, waxes, or corn starch.
  - Acceptable excipients should come from natural sources, including plant (starches, sugars, cellulose), Animal lactose, gelatin, stearic acid), Mineral (calcium phosphate, silica).
  - Watch out for: GMO products, artificial color/flavor, artificial sweeteners, preservatives (sodium benzoate), wheat, dairy, soy, corn.

Mindell E. Earl. Mindell's Supplement Bible, Mindell paperback, 1998:20

Supplements: What to Look For

- Processing procedure
  - Disintegration
    - Put in water and/or vinegar and agitate
    - Should dissolve within 10-30 minutes

http://www.worldnutrition.info/docs/Disintegration_and_Dissolution_of_DietarySupplements.pdf

Supplements: What to Look/Out For

- Expiration Date – no date/no good
- Minerals
  - Oxides & carbonates – very poor bioavailability
  - Citrate, glycinate, aspartate - better
  - Amino acid chelates (Albion Labs) – best
- Vitamins
  - Vitamin E – d-alpha-tocopherol (not 'dl')
    - Look for 'mixed tocopherols' – gamma, delta, beta
  - Folic Acid – Look for 'L-5-methyl-tetrahydrofolate or 5-formyl tetrahydrofolate' not just 'folic acid'
- Fish oil – 'pharmaceutical grade', 'molecularly distilled', 'independently tested for purity'
- Whey protein – ion-exchanged, cross-filtered, hydrolyzed; casein & lactose free

Supplements: What to Look/Out For

- Herbals
  - Therapeutic parts of Echinacea and Ginseng, are from the roots, not the stem or flower.
  - "Standardized extract" a product with a specified minimum level of one or more plant constituents
  - Must list the medicinal component and amount
    - St. John's Wort 0.3% hypericin, 0.3% hyperforin
    - Echinacea (angustifolia) root extract (4% echinacosides), Standardized Echinacea (purpurea) root extract (2% cichoric acid derivatives)
    - Ginseng root extract (4% ginsenosides)

Quality Supplements

- Good Manufacturing Practices (GMP certified)
  - Three entities that offer GMP certification
  - Audits the procedures that control each step from: receipt and storage of raw material → in-process material and finished product → manufacturing process → testing (raw materials, in-process and finished product)→filling, labeling and packaging → finished product approval → document review → release and distribution

www.npainfo.org www.nsf.org www.nnfa.org

Manufacturers

- Metagenics
  - GMP-certified
  - Scientific evaluation of ingredients
  - Comprehensive safety reviews of products
  - Human clinical evaluations of THEIR products
  - Excellent in-house scientific staff
- Nutrition Dynamics
- Ortho Molecular Products
- Standard Process
- Biotics Research
- Thorne

What's In Your Multivitamin?

INGREDIENTS:
Calcium Carbonate, Potassium Chloride, Pregelatinized Corn Starch, Ascorbic Acid (Vit. C), Dibasic Calcium Phosphate, Magnesium Oxide, Crospovidone. **Contains < 2% of:** Acacia, Ascorbyl Palmitate, Beta-Carotene, BHT, Biotin, Boric Acid, Calcium Pantothenate, Calcium Stearate, Cholecalciferol (Vit. D3), Chromium Picolinate, Citric Acid, Corn Starch, Cupric Sulfate, Cyanocobalamin (Vit. B12), dl-Alpha Tocopheryl Acetate (Vit. E), FD&C Blue No. 2 Aluminum Lake, FD&C Red No. 40 Aluminum Lake, Ferrous Fumarate, Folic Acid, Gelatin, Hydrogenated Palm Oil, Hypromellose, Lecithin, Lutein, Magnesium Stearate, Manganese Sulfate, Medium-Chain Triglycerides, Microcrystalline Cellulose, Modified Food Starch, Niacinamide, Nickelous Sulfate, Phytonadione (Vit. K), Polyethylene Glycol, Polyvinyl Alcohol, Potassium Iodide, Pyridoxine Hydrochloride (Vit. B6), Riboflavin (Vit. B2), Silicon Dioxide, Sodium Ascorbate, Sodium Benzoate, Sodium Borate, Sodium Citrate, Sodium Metavanadate, Sodium Molybdate, Sodium Selenate, Sorbic Acid, Sucrose, Talc, Thiamine Mononitrate (Vit. B1), Titanium Dioxide, Tocopherols, Vitamin A Acetate (Vit. A), Zinc Oxide. **May also contain < 2% of:** Maltodextrin, Sodium Aluminosilicate, Sunflower Oil, Tribasic Calcium Phosphate. **Contains:** Soy.

Suggested Use:
Adults – Take one tablet daily with food. Not formulated for use in children. Do not exceed suggested use.

Supplement Safety

"There was not even one death caused by a vitamin or dietary mineral in 2007, according to the most recent statistics available from the U.S. National Poison Data System."

Bronstein AC, et al. American Association of Poison Control Centers. 2007 Annual Report of the American Association of Poison Control Centers' National Poison Data System (NPDS): 25th Annual Report. Clin Toxicol. 2008 Dec;46(10):927-1057.

"Well over half of the U.S. population takes daily nutritional supplements. Even if each of those people took only one single tablet daily, that makes 165,000,000 individual doses per day, for a total of over 60 billion doses annually… Over 60 billion doses of vitamin and mineral supplements per year in the USA, and not a single fatality."

http://orthomolecular.org/resources/omns/v07n16.html

Nutrients are VERY SAFE!!!

Codex Alimentarius

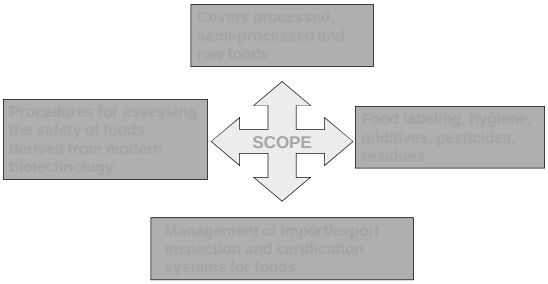
- Latin for "Book of Food"
- Collection of internationally recognized standards, codes of practice, guidelines and other recommendations relating to foods, food production and food safety
- Developed by the Codex Alimentarius Commission

Codex Alimentarius Commission

- Established in 1961 by Food and Agriculture Organization or the United Nations
- Joined by World Health Organization in 1962
- Governed by the World Trade Organization

To protect the health of consumers and ensure fair practices in the international food trade

Codex Alimentarius



Codex Alimentarius Controversy

- Relates to perception that it is a mandatory standard for the safety of food, including vitamin and mineral supplements.
- In 1996, the German delegation put forward a proposal that no herb, vitamin or mineral should be sold for preventative or therapeutic reasons & that supplements should be reclassified as drugs.
  - Proposal was agreed, but protest halted implementation

Health supplements: R.I.P.'. The Guardian newspaper, UK. Published 14 September 2002. Accessed 2 August 2008

Codex Alimentarius Controversy

- 28th Session in July 2005 discussed the Guidelines for Vitamin and Mineral Food Supplements
  - Adopted as new global safety guidelines
  - Does not seek to ban supplements
  - Sets criteria for establishing maximum and minimum dosing levels
  - Requires that safety and efficacy are considered when determining ingredient sources
- However, did not specify whether supplements should be regulated as therapeutic goods, pharmaceuticals or foods

"UN commission adopts safety guidelines for vitamin and food supplements". United Nations News Centre. 11 July 2005. Retrieved 17 September 2012.
Codex Guidelines for Vitamin and Mineral Food Supplements

Codex Alimentarius Controversy

- Denies that dietary supplements can benefit normal, healthy people
- Defines dietary supplements as only those vitamins and minerals that the body cannot manufacture itself
- Restricts the upper-limits of vitamins and minerals using a "risk assessment"
- Restricts any physiological benefit information from consumers
- Creates "positive" and "negative" lists of dietary supplements

Codex Alimentarius Resources

- http://www.codexalimentarius.org
- 'Understanding the Codex Alimentarius' Published in 2005 by the World Health Organization and the Food and Agriculture Organization of the United Nations.
- alliance-natural-health.org, A not-for-profit organization working to protect and promote natural health care by 'good science and good law'.
- BBC.co.uk, 'Vitamin controls backed by Europe: Tightening rules on the sale of vitamins and minerals'
- FAO.org, 'helping to build a world without hunger'
- Healthfreedomusa.org, Dr. Rima Laibow website
- Newstarget.com Guidance for Industry on Complementary and Alternative Medicine Products and their Regulation by the FDA

Dietary Supplement Health and Education Act of 1994

- Defines "dietary supplements"
  - "Any product which contains one or more dietary ingredients such as vitamins, minerals, herbs or other botanicals, amino acids or other ingredients used to supplement the diet."
  - No longer regulated as food additives or drugs

Dietary Supplement Health and Education Act of 1994

- Safety
  - FDA maintains authority to safeguard the public against unsafe products
- Claims
  - Allow "truthful and nonmisleading claims that describe the role of a nutrient in supporting wellness".
    - i.e., calcium builds strong bones; antioxidants protect against cell damage
  - Outlines process for substantiation of claims
  - Allows for dissemination of information
    - Cannot be false/misleading, promote a specific brand, present a balanced view of scientific evidence

Dietary Supplement Health and Education Act of 1994

- Labeling requirements
  - Claims may not be made about the use of a dietary supplement to **diagnose, prevent, mitigate, treat, or cure a specific disease**
- Good Manufacturing Practices (GMPs)
  - FDA is authorized to establish GMPs for supplements – updated Dec. 2010
    - Nonbinding recommendations
      - "You can use an alternative approach if the approach satisfies the requirements of the applicable statutes and regulations."
  - If a label claims to meet specific quality standards (such as USP) it must do so

http://www.fda.gov/Food/GuidanceRegulation/GuidanceDocumentsRegulatoryInformation/DietarySupplements/ucm238182.htm

Dietary Supplement Health and Education Act of 1994

- New Government Entities
  - Commission on Dietary Supplement Labels
    - Made recommendations on "how best to provide truthful, scientifically valid, and not misleading information to consumers";
  - Office of Dietary Supplements Research (NIH)
    - Coordinate research on dietary supplements and disease prevention, develop a database of supplement research, and advise the Secretary of Health and Human Services on supplement regulation, safety, and health claims

Issues with DSHEA

- Burden of proof on FDA
  - New ingredients/inadequate information
    - "reasonable assurance that the ingredient does not present a significant or unreasonable risk of illness or injury."
  - Safety – rely on adverse events reports, literature searches and product sampling
    - "significant or unreasonable risk of illness or injury"
    - "a poisonous or deleterious substance which may render it injurious to health"
  - Adulterated ingredients

For More Information: www.fda.gov/opacom/laws/dshea

Nutrient-Drug-Food Interactions

- Phase 1 Detoxification Inhibitors:

SSRI Antidepressants	**Cimetidine (Tagamet)**	**Antibiotics**
Azole Antifungals	Clopidogrel (Plavix)	**Proton Pump Inhibitors**
Sulfa- Antibiotics	Valproic acid (Depakote)	HIV Anti-Virals
Oral contraceptives	Prednisone	Tamoxifin
Interferon	**THC**	Phenytoin (Dilantin)
Genetic Polymorphism	**Nutrient depletion**	
Grapefruit/juice	Safrole (root beer)	**St. John's Wort**
Kava kava	Golden seal/berberine	Quercetin
Star fruit	Ginseng	Echinacea

Nutrient-Drug-Food Interactions

- Grapefruit/juice – almost all medications

Nutrient-Drug-Food Interactions

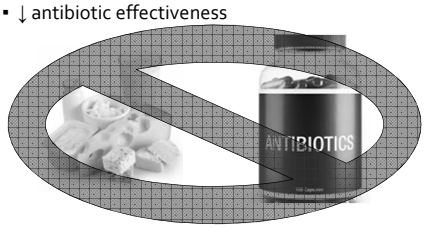
- Licorice
  - Can ↓ potassium and ↑ sodium retention
    - Digoxin effects greatly enhanced
    - Can elevate blood pressure
  - Glycyrrhizic acid can ↑ the half-life of cortisol
    - Enhance effects of glucocorticosteroids
  - ↑ metabolism and ↓ effectiveness of Warfarin
  - Do not use with those that have hypertension, heart problems, kidney problems
  - Increased risk of pre-term labor during pregnancy

Nutrient-Drug-Food Interactions

- Tyramine-rich foods
  - Chocolate, aged cheeses, smoked/aged/fermented meats, hot dogs, processed lunch meats, fermented soy products, draft beer, wine, bananas, yeast, avocado, chicken/beef liver
- Can cause abrupt ↑ blood pressure
- Trigger for headaches/migraines in some people
- MAOIs & Carbidopa/Levadopa interfere with tyramine metabolism

Nutrient-Drug-Food Interactions

- Dairy
  - Can bind with antibiotics in GI tract
    - ↓ absorption
    - ↓ antibiotic effectiveness



Nutrient-Drug-Food Interactions

- Levothyroxine
  - ↓ absorption & effectiveness
    - Low stomach acid
      - Antacids/PPI/H2 Antagonists all decrease effectiveness
    - Dairy products
    - Mineral supplements (especially calcium carbonate and ferrous sulfate)
    - Grapefruit juice
  - Best taken at least 1+ before meals; 4 hours prior to mineral supplements

Nutrient-Drug-Food Interactions

- Grapefruit/juice – almost all medications
- St. John's wort – many medications
- Licorice – digoxin, high blood pressure medications, warfarin, glucocorticosteroids
- Tyramine-rich foods – can cause increased blood pressure; MAOIs & Carbidopa/Levadopa interfere with tyramine metabolism
- Dairy – antibiotics
- Levothyroxine – food/supplements/antacids

Nutrient Depletion and Medications

Type of Drug	Name Brand Examples	Nutrients Depleted	Potential Solutions
Antacids	H2 blockers: Axid, Pepcid, Tagemet, Zantac PPI: Nexium, Prevacid, Prilosec	Vitamin B12, folic acid, vitamin D, calcium, iron, zinc, protein	Intrinsi B12-Folate or Hemagenics – 1 tablet BID Multi-Min Chelate – 1 tablet TID
Antibiotics	General Aminoglycosides (gentomycin, neomycin, streptomycin), Cephalosporins, Penicillins Tetracyclines	B-vitamins, vitamin K, Friendly Intestinal Bacteria Calcium, zinc, magnesium, iron, vitamin B6	UltraFlora Spectrum – 1 capsule BID on empty stomach Glycogenics – 1 tablet BID
Anti-diabetic drugs	Micronase, Tolinase Glucophage, Metformin	CoQ10 CoQ10, vitamin B12, folic acid	CoQ10 (100 mg) – 1 gelcap BID Intrinsi B12-Folate – 1 tablet BID
Anti-depressants	Adapin, Aventyl, Elavil, Tofranil, Pamelor, Sinequan, Norpramin	Vitamin B12, CoQ10, neurotransmitters	Intrinsi B12-Folate – 1 tablet BID CoQ10 (100 mg) – 1 gelcap BID Amino acid therapy as needed
Anti-Convulsion drugs	Dilantin, Tegretol	Folic acid, Vitamin D, B12, B6	IntrinsiB12-Folate – 1 tablet BID D3-5000 – 1-2 capsules daily
Anti-Inflammatories	Aspirin & Salicylates NSAIDs: Advil, Aleve, Motrin, Naprosyn, Ibuprofen Corticosteroids: Cortisone, Hydrocortisone, Prednisone	Vitamin C, folic acid, potassium Folic acid Vitamin C, folic acid, calcium, magnesium, potassium, selenium, zinc	Ultra Potent C – 1 tsp – 1-2x/day ActiFolate – 1 tablet/day Glutagenics – 1 tsp TID Multi-Min Chelate – 1 tablet TID ActiFolate – 1 tablet BID
Antihypertensives / High Blood Pressure	Apresoline Atenolol, Lopressor/Toprol-XL, Propranolol/Inderal Lotensin, Vasotec, Lisinopril/Prinivil, Capoten/Capoten	Vitamin B6, CoQ10 CoQ10, melatonin CoQ10, sodium	CoQ10 (100 mg) – 1 gelcap BID Glycogenics – 1 tablet BID

Nutrient Depletion and Medications

Diuretics	Hydrochlorothiazide/HCTZ, Metalzaone/Zaroxolyn Lasix, Bumex	Magnesium, potassium, zinc, CoQ10, sodium Vitamins B1, B6, C; magnesium, calcium, potassium, zinc, sodium	Multi-Min Chelate – 1 tablet TID CoQ10 (100 mg) – 1 gelcap/day Glycogenics – 1 tablet BID Multi-Min Chelate – 1 tablet TID
Cholesterol Lowering Agents / Statins	Lipitor, Zocor, Mevacor, Pravachol, Crestor, Lescol Colestid, Questran	CoQ10 Vitamins A, B12, D, E, K, beta-carotene, folic acid, iron	CoQ10 (100 mg) – 1 gelcap BID Multigenics Intensive Care – 2 tablets TID with meals
Hormone Replacement Therapy (HRT)	Evista, Prempro, Premarin, Estratab	Vitamins B2, B6, B12, C, folic acid, magnesium, zinc	Wellness Essentials for Women – 1 packet QD
Oral Contraceptives (BCP)	Norinyl, Ortho-Novum, Triphasil, etc.	Vitamins B2, B3, B6, B12, C, folic acid, magnesium, selenium, zinc	Wellness Essentials for Women – 1 packet QD

QD = 1x/day with meals (unless stated otherwise)
BID = 2x/day with meals (unless stated otherwise)
TID = 3x/day with meals (unless stated otherwise)

Questions???