Entry Level Clinical Nutrition
Part XXI

Putting it all together

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“The world is full of obvious things which nobody by any chance ever observes…”

Arthur Conan Doyle
The Hound of Baskervilles
If it looks like a duck, quacks like a duck, and walks like a duck, it’s probably a duck.
"After adjusting for other dietary factors, each serving of whole grains is estimated to reduce CRP concentrations by approximately 7%. In contrast to epidemiologic studies, interventional studies do not demonstrate a clear effect of increased whole-grain consumption on CRP or other markers of inflammation."
“High blood concentrations of folic acid may be related to decreased natural killer cell cytotoxicity, and high folate status may reduce the response to antifolate drugs used against malaria, rheumatoid arthritis, psoriasis, and cancer. In the elderly, a combination of high folate levels and low vitamin B-12 status may be associated with an increased risk of cognitive impairment and anemia and, in pregnant women, with an increased risk of insulin resistance and obesity in their children.”

"The overall mean accuracy of ECG interpretation was 52..."


"Clearly, we overestimate our ability to correctly deploy tests, interpret test results, and act appropriately on the results of clinical interactions and subsequent investigations."
Just because the knife has been removed does not mean that the wound is healed.

Why is ELCN needed?
Efficacy

Simplicity

Cost

Cost effectiveness

Cost effectiveness

“The truth is that for a large part of medical practice, we don’t know what works. But we pay for it anyway. Our annual per capita health care expenditure is now over $8,000. Many countries pay half that — and enjoy similar, often better, outcomes. Isn’t it time to learn which practices, in fact, improve our health, and which ones don’t?”

“…To find out, we more medical research. But not just any kind of medical research. Medical research is dominated by research on the new: new tests, new treatments, new disorders and new fads. But above all, it’s about new markets.”

“We don’t need to find more things to spend money on; we need to figure out what’s being done now that is not working. That’s why we have to start directing more money toward evaluating standard practices—all the tests and treatments that doctors are already providing.”
• “…an epidemic of overtreatment – too many scans, too many blood tests, too many procedures – is costing the nation’s health care system at least $210 billion a year, according to the Institute of Medicine, and taking a human toll in pain, emotional suffering, severe complications and even death.”
• “'What people are not realizing is that sometimes the test poses harm,' said Shannon Brownlee, acting director of the health policy program at the New America Foundation and author of 'Overtreated: Why Too Much Medicine Is Making Us Sicker and Poorer.'”
• “'Sometimes the test leads you down a path, a therapeutic cascade, where you start to tumble downstream to more and more testing, and more and more invasive testing, and possibly even treatment for things that should be left well enough alone.'”

Efficacy issues

“The premise of the standard regulatory model, ‘homeostasis’, is flawed: the goal of regulation is not to preserve constancy of the internal milieu. Rather, it is to continually adjust the milieu to promote survival and reproduction. Regulatory mechanisms need to be efficient, but homeostasis (error-correction by feedback) is inherently inefficient. Thus, although feedbacks are certainly ubiquitous, they could not possibly serve as the primary regulatory mechanism.”


“In the context of allostasis, resilience denotes the ability of an organism to respond to stressors in the environment by means of the appropriate engagement and efficient termination of allostatic responses.”
Allostatic load or overload

“…the cumulative ‘wear and tear’ seen on body systems after prolonged or poorly regulated allostatic responses.”

Simplicity issues…
…for the patient


Results. Patterns of behavior change following diagnosis indicated that the vast majority of individuals diagnosed with a new chronic condition did not adopt healthier behaviors. Smoking cessation among those with heart disease was the largest observed change, but only 48% of smokers quit. There were no significant increases in exercise for any health condition. Changes in alcohol consumption were small, with significant declines in excessive drinking and increases in abstention for a few health conditions. Over the long term, individuals who made changes appeared to maintain those changes. Latent growth curve analyses up to 14 years after diagnosis showed no average long-term improvement in health behaviors.

Discussion. Results provide important new information on health behavior changes among those with chronic disease and suggest that intensive efforts are required to help initiate and maintain lifestyle improvements among this population.

Key words: chronic disease; disease management; health behavior; rehabilitation; secondary prevention.

By 2009-10, 45 percent of the respondents older than 65 had two or more chronic diseases, including stroke, emphysema, asthma and kidney disease. A decade earlier, only 37 percent did.


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"I felt like I was in a Charlie Brown cartoon," he said, recounting the visit with a laugh. "All I can remember the doctor saying was, 'Waa, waa-waa, waa-waa.'"
…for the practitioner

“When assessed using the Maslach Burnout Inventory, 45.8% of physicians reported at least 1 symptom of burnout. Substantial differences in burnout were observed by specialty, with the highest rates among physicians at the front line of care access (family medicine, general internal medicine, and emergency medicine).”

“Compared with a probability-based sample of 3442 working US adults, physicians were more likely to have symptoms of burn-out (37.9% vs 27.8%) and to be dissatisfied with work-life balance (40.2% vs 23.2%).”


“But doctors in Massachusetts *have* recognized the problem. The legislature there forgot to consider what doctors are actually *doing* in Massachusetts:

They’re leaving.
The metabolic basis
• “Cachexia may well represent the devastating flip side of the tremendous achievements of modern medicine, as the incidence of cachexia is also a function of survival of chronic illness.”

• “Many diseases – which rapidly led to death only a few years ago – are now better controlled by new therapies. Even if we cannot cure and eradicate these diseases, their natural history has significantly increased by months and years. Although these new therapeutic strategies represent a remarkable advantage over the previous standards of care, it is impossible to ignore the fact that many more patients are now facing the nutritional and metabolic consequences of prolonged immunological and hormonal challenges due to both the illness process itself and the aggressive therapies.”


“The complex syndrome of cancer cachexia (CC) that occurs in 50% to 80% of cancer patients has been identified as an independent predictor of shorter survival and increased risk of treatment failure and toxicity, contributing to mortality and morbidity in this population.”
An exploration of the experience of cancer cachexia: what patients and their families want from healthcare professionals


“While cachexia is prevalent in cancer, it is not exclusive to it and is seen in many conditions including AIDS, congestive heart failure, rheumatoid arthritis and Crohn’s disease”

- “Currently in cancer cachexia management, no clinical intervention has been shown to significantly impact on morbidity and mortality, progress functional status or improve quality of life.”
- “Indeed, practice guidelines detailing the most advantageous therapeutic treatment modality for cancer cachexia have yet to be determined.”
- “This may help explain the silent response from healthcare professionals, as perceived by participants within the present study.”
Why is it needed:
Beyond biochemistry and physiology

• Cost effective – Does not rely heavily on functional lab tests or massive supplemental protocols.
• Time effective – Its back to basics approach is very time efficient.
• Conceptually simple – Easier to explain to patients, which improves compliance.

What is it from a very basic, “in the trenches,” clinical standpoint?
Underlying hypotheses of Entry Level Clinical Nutrition:

- Chief complaints in chronically ill patients are not diseases but responses that have gone on too long (Allostatic load).
- The metabolic imbalances that combine to form this response have been well defined by critical care nutritionists.

Entry Level Clinical Nutrition:

A new model of functional medicine that incorporates allostatic load
FUNCTIONAL MEDICINE – ENTRY LEVEL CLINICAL NUTRITION MODEL

KEY METABOLIC IMBALANCES SEEN WITH ALLOSTATIC LOAD

- Metabolic acidosis
- Loss of lean body mass (sarcopenia)
- Insulin resistance
- Inflamm-aging (Increased innate immunity and decreased adaptive immunity)
- Suboptimal caloric intake and carbohydrate:protein ratio (Refeeding syndrome)
- Gastrointestinal dysfunction/gut atrophy
- Excess or deficiencies of key macro and micronutrients such as protein, zinc, selenium, and vitamin D, plus sleep, movement, companionship, etc.
THE CREATION OF THE EXCESSIVE CATABOLIC PHYSIOLOGY “RESPONSE”

Chronic inflammation, inflammaging, metainflamm.

- Low calorie intake and excessive carbohydrate/protein ratio – Refeeding syndrome
- Hyperinsulinemia/Insulin resistance
- Sarcopenia/Loss of lean body mass
- Gut dysfunction/atrophy
- Low grade chronic metabolic acidosis/fluid electrolyte imbalance

Key deficiencies or excesses, i.e., Calories, macronutrients, B vitamins, zinc, selenium, iodine, sleep, psychological and chemical stress, movement against gravity, weight


"...obesity is a state of low-grade, chronic inflammation that promotes the development of insulin resistance and diabetes. Ironically, the formation of systemic and/or local, tissue-specific insulin resistance upon inflammatory cell activation may actually be a protective mechanism that co-evolved to repartition energy sources within the body during times of stress during infection."
FUNCTIONAL MEDICINE – ENTRY LEVEL CLINICAL NUTRITION MODEL

Infection Gastroenterology Toxicology Nutrient imbalance Neurology Endocrinology

ALLOSTATIC LOAD – ACUTE/CHRONIC PHASE RESPONSE

Inflammaging/Metainflammation → Alteration of macronutrient metabolism

- Increases in cytokines/CRP
- Alteration of micronutrient metabolism
- Water sol. vitamins, vitamins D and E, electrolytes, Fe, Se, Zn

↑ Gluconeo
↑ IDO/TDO
↑ Homocys/↓S
↑ Catabolism
↑ Acidosis

↓ Lactate
↓ HDL
↓ ↑ EFAs

Plus genetic propensity

IBS, IBD, Dysbiosis MCS

Signs/symptoms of deficiency/excess Depression Anxiety Thyroid Diabetes Stress

Treat second!!!

RULE OUT PATHOLOGY!!

Treat first !!! (Remove adverse environmental sources)(Remember hormesis!)

Treat third!!!

Specifically, how does it work?
First appointment procedure

• At the time the patient makes the first appointment, request that the following be submitted before the first appointment (This will “weed out” those who are serious about making changes to improve their health versus those who are looking for “magic pills”):
  – Any lab test that has been performed within the last two years.
  – A written history of the chief complaint.
  – A three day dietary history. Specifically request “everything that goes into your mouth for three days” as the patient will often neglect to include important items such as liquids, chewing gum, breath mints, snack foods, etc. if the request only states “a three day dietary history.” Please remember that many if not most patients today are creating most of the diet related metabolic imbalances at snack time, not at meal time.
• Review the above before the first appointment to gain familiarity so that repore can be created as soon as possible upon meeting the patient. Upon meeting the patient, make sure you indicate that you read this information by thanking the patient for doing such an excellent job in providing it.

• Upon first meeting the patient, examine the patient visually. Take mental note of any of the following:
  – Look for any signs of loss of muscle mass such as “floppy” triceps, “saggy” gluteal muscles, and overall muscle definition in arms and legs.
  – Look at the face and any other exposed areas to see skin tone. Is it smooth and supple with healthy coloring or wrinkled, hard, shiny, or pasty?
  – Look at the posture and gait. Does it suggest confidence, fear, anger, resentment, or despair?

• Take a detailed history by asking key questions (See enclosed questionnaire). It is strongly advised not to use history or symptom “forms” that the patient fills out for the following reasons:
  – Truly understanding the patient’s concerns, fears, desires, etc. and establishing a caring and friendly relationship is probably more important than gaining factual information in terms of successful resolution of chief complaints.
  – Key information that may be most important to understanding how the patient became chronically ill is often sensitive and potentially embarrassing. Very rarely will patients indicate this information on a form.
  – Patients often forget key information or do not completely understand the questions.
  – Every patient has a story to tell. Odds of resolution of chief complaints increase dramatically if the patient is allowed to tell this story even though you have heard variations of this story from many patients many times.
  – Patients generally dislike filling out long detailed forms, especially since the practitioners seen before you rarely indicated to the patient that these forms were carefully and diligently read. In turn, starting out with several lengthy forms can often lead to the formation of negative attitudes towards you even before the critical first encounter.
• Get body weight and analysis of body composition using bioelectric impedance scale.
• Perform grip strength test.
• Perform gait speed test.
• Perform zinc taste test.
• Give roll of pH paper and explain first morning urine pH procedure (Measure first morning urine pH upon rising for five days). If the patient indicates that he or she wakes up several times during the night, urine pH should be measured at the time the patient arises to start the day’s activities. **Make sure you charge for the roll of pH paper as this will help “weed out” those who are serious about working with you.**

• Provide a basic explanation of why the first appointment was conducted in the manner just described and a preliminary hypothesis concerning the cause of the patient's chief complaints and how they will be addressed. This preliminary description should include the following:
  – A general overview of what will be required of the patient in terms of lifestyle modifications (Be prepared to compromise with the patient, if possible).
  – Time commitments.
  – Cost, including supplements and future laboratory testing.
  – A disclaimer that this explanation is preliminary and will be followed by a formal presentation of findings and treatment plan at the next appointment.

• **The duration of the first appointment should be approximately 1.5 – 2.0 hours in length. Make sure you charge an appropriate fee for this time.**
Clinical indicators for each metabolic category

Low grade chronic metabolic acidosis/fluid electrolyte imbalance

- First morning urine pH below 6.4 (Should be between 6.4 and 7.0).
- Elevated or depressed serum potassium (Should be close to 4.5 mmol/L).
- High or high normal serum sodium and chloride.
- High or high normal BUN with normal creatinine.
- Low or low normal CO₂.
Sarcopenia/Loss of lean body mass

- Bioelectric impedance analysis (BIA) to measure percent body fat and lean body mass.
- Grip strength (Jamar Dynamometer)
- Visual appearance
- Gait speed
- Serum or bloodspot amino acids
- Daily protein intake (For most patients it should be from 1.2 – 1.5 g/kg/d).
- Level of weight bearing exercise

Insulin resistance

- Serum glucose above 90 mg/dL
- Cravings – usually carbohydrate-based.
- Glycosylated hemoglobin.
Suboptimal caloric intake and carbohydrate:protein ratio (Refeeding syndrome)

- Skipping meals and then binging on carbohydrates.
- Low or low normal serum potassium (Below 4.0 mmol/L).
- Low or low normal serum phosphate.
- Low serum magnesium

Inflamm-aging (Increased innate immunity and decreased adaptive immunity)

- Autoimmune signs and symptoms plus frequent colds and flu.
- Elevated C-reactive protein. Metabolically, virtually none should be present.
- Low normal neutrophils and high normal lymphocytes.
Inflamm-aging (Increased innate immunity and decreased adaptive immunity)

- Rule out food sensitivities – Clinical experience suggests that simple elimination of commonly ingested foods for 10-14 days will be the most cost effective analytical method.
- If simple elimination/challenge methods are ineffective or not possible due to compliance issues, consider lab tests such as ALCAT (Keep in mind, though, that all food allergy testing technologies are expensive and yield a fair amount of false positives and false negatives).

Gastrointestinal dysfunction/gut atrophy

- Signs and symptoms
- Eating fast and eating under stress
Excess or deficiencies of key factors

- Calories and macronutrients
- Vitamin D – 25(OH)D below 30 ng/mL
- Zinc – zinc taste test
- Selenium – elevated RDW
- Iodine
- Sleep
- Movement
- Companionship
- *Usual daily stressors*

Treatment considerations
Please keep the numerous metabolic interactions in mind. For example, correction of low grade, chronic metabolic acidosis will have a profound impact on insulin resistance and inflamm-aging.
Low grade chronic metabolic acidosis/fluid electrolyte imbalance

- Low grade, chronic metabolic acidosis has many causes (Lack of sleep, medications, over exercise, major pathology, i.e. renal disorders, autoimmune conditions). However, for the average American ingesting the average American diet, a major contributing factor is a acid-based, low potassium/magnesium diet. In this situation the following is recommended if the first morning urinary pH is below 6.4:

One night #1 do one of the following:
1) Ingest 1 K Alkaline + Mg (Moss Nutrition) before bedtime
   or
2) Ingest 1 K Alkaline and 1 Mg Glycinate (Moss Nutrition) before bedtime
Low grade chronic metabolic acidosis/fluid electrolyte imbalance

• Check the first morning urinary pH the next morning.
• If it is still below 6.4, increase the dose by one at bedtime that day.
• Continue increasing each day until the first morning urinary pH is at least 6.4.

Low grade chronic metabolic acidosis/fluid electrolyte imbalance

• Clinical experience suggests that if the first morning urinary pH is not at least 6.4 by day 6, other factors besides diet are contributing to the low grade, chronic metabolic acidosis.
• In this situation, review all diagnostic information to determine the contributing factor.
Sarcopenia/Loss of lean body mass

• Institute a patient specific exercise program that incorporates both weight bearing and aerobic exercise.
• Determine optimal caloric intake (usually 2000-2500 kcal per day – with the exception of reactive hypoglycemia/refeeding syndrome).

Sarcopenia/Loss of lean body mass

• Calculate protein intake (usually 1.2 – 1.5 g per kilogram body weight per day).
• Correct diet to get as close the optimal caloric and protein intake as possible.
• If optimal levels cannot be attained via diet alone, consider use of a meal supplement drink such as Select Meal (Moss Nutrition).
• If drinks cannot be tolerated or significant GI dysfunction exists, consider use of a free form amino acid supplement.
• Research suggests that increases in lean body mass will be more effective with a supplement containing both protein and carbohydrate.
Sarcopenia/Loss of lean body mass

Monitor progress using the following:

• BIA testing
• Grip strength
• Gait speed

Insulin resistance

• Optimize overall dietary quality and protein/carbohydrate ratio.
• *Place particular emphasis on liquids*
• *Create a “comfort food” allowance*
• Optimize rate of food ingestion
• Advise patient to always eat in a relaxed, focused manner (Do not eat standing up, in a car, or when doing other activities).
• Females, in particular, should always ingest meals with at least one like-minded companion.
• Consider the use of a glycemic supplement such as Metabolic Synergy (DFH).
• Credible anecdotal reports suggest that reduction of cravings is the best indicator of progress.
Suboptimal caloric intake and carbohydrate:protein ratio (Refeeding syndrome)

- Same recommendations as with correction of insulin resistance except add the following:
- Increase caloric intake slowly, often starting with as little as 1000-1500 kcal per day.
- If serum potassium is below 4.0 mmol/L, supplement 1-2 K Alkaline + Mg or 1-2 each of K Alkaline and Mg Glycinate per day.
- Consider use of Ultra B Complex (BioGenesis) to supply thiamin.
- Credible anecdotal reports suggest that reduction of cravings is the best indicator of progress.

Inflamm-aging (Increased innate immunity and decreased adaptive immunity)

- Institute a diet that consists of as few patient specific food allergens as possible.
- Keep in mind that correction of virtually all the metabolic issues mentioned will have an optimizing effect on inflamm-aging.
- Consider use of a quality fish oil product and an anti-inflammatory formulation such as Bio-Inflammatory Caps (BioGenesis).
- Reduction of C-reactive protein, optimization of the white cell differential, and fewer episodes of colds and flu and excellent indictors of progress.
Gastrointestinal dysfunction/gut atrophy

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- Correct diet to get as close the optimal caloric and protein intake as possible.
- If optimal levels cannot be attained via diet alone, consider use of a meal supplement drink such as Select Meal (Moss Nutrition).
- If drinks cannot be tolerated or significant GI dysfunction exists, consider use of a free form amino acid supplement.
Gastrointestinal dysfunction/gut atrophy

Consider use of the following digestive aids:

• Betaine HCl (DFH)
• GastroSelect (Moss Nutrition)
• GI Select I and II (Moss Nutrition)

Excess or deficiencies of key factors

Address the following:

• Sleep
• Movement
• Companionship
• Usual daily stressors
• Anything else in the patient's life that appears to be in excess or deficiency

Optimize diet and supplement the following as needed

• Calories and macronutrients
• Vitamin D (Moss Nutrition) – 2000 IU/day (Monitor with serum 25 (OH) D levels)
• Zinc Supreme (DFH) - 20 – 30 mg/day (Monitor with zinc taste test)
• Selenium – 200 mcg/day (Monitor with serum RDW)
• Iosol – Start with 1 drop (1.8 mg) per day – Increase as needed
Some final, big picture thoughts

Major clinical advantages of Entry Level Clinical Nutrition

- Metabolic basis and efficacy is supported by a large volume of clinical intervention studies performed on humans.
- Diagnostic modalities are simple and inexpensive
- Diagnostic and treatment modalities are designed with patient compliance in mind.
- A total inventory of less than 20 supplements is employed.
“The world is full of obvious things which nobody by any chance ever observes…”

Arthur Conan Doyle
The Hound of Baskervilles

Moderation
Variety
Common sense

Thank you!!