

Study Guide
for the
CERTIFIED CLINICAL
NUTRITIONIST (CCN)
EXAMINATION



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The Development of an Examination

Constructing a Content-Valid Examination

The development of a valid examination begins with a clear and concise definition of the knowledge, skills, and abilities needed for competent job performance. Using interviews, surveys, observation, and group discussions, CAS worked with experts in the field of clinical nutrition to delineate critical job components. This analysis (the Role Delineation) determines test content. In addition, throughout the examination construction process, The CNCB Scientific Council maintains constant validity checks, thus assuring that the examinations produced are valid and reliable measures of the content knowledge and abilities required for one to function as a competent Clinical Nutritionist.

The Diagram below lists each of the steps involved in constructing a content-valid examination.

Role Delineation * Construction of a Test Blueprint * Item Development and Validation * Analysis of Test Items * Examination Development * Review and Revision * Cut Score * Content-Valid Exam

>Role Delineation

To realize the CNCB's commitment to developing a valid examination for its certification examination, CAS asked expert clinical practitioners to clearly and concisely define the knowledge, skills, and abilities that are the keystones of the profession. Using surveys, observation, and group discussions, CAS conducted the first Role Delineation study for the CNCB to obtain such a definition and to identify critical job components. The Role Delineation study ensures that the CCN examination measures the knowledge and skills required to be a Clinical Nutritionist. The results of the Role Delineation study are analyzed and incorporated into the CCN Certification Examination.

The following chart illustrates how major job components ("Performance Domains") are organized into tasks, knowledge areas, and skills.

The Hierarchical Arrangement of Components in a Role Delineation Study
Profession * Performance Domains * Tasks * Knowledge Areas and Skills

The following are examples of major Performance Domains taken from the Role Delineation study for CNCB.

1. Basic Knowledge Related to Nutrition
2. Nutrition Assessment and Evaluation
3. Nutrition Counseling and Case Management
4. Professional Practice Responsibility
5. Professional Responsibility
6. Optimal Human Nutrition – PGSCN Session I
7. Human and Cognition Overload – PGSCN Session II
8. Detoxification, Herbology & Homeopathic Therapy– PGSCN Session III
9. Laboratory Assessment – PGSCN Session IV

The Role Delineation study also determines the type and nature of the examinations to be given. For example, the Role Delineation study may determine that a written examination alone is necessary to measure knowledge, skills, and competence. It may indeed be that further testing does not have greater predictive value concerning competence. On the other hand, a Role Delineation may demonstrate that two types of examinations are needed to indicate competence as a Clinical Nutritionist. Perhaps a written examination in conjunction with either an oral/practical examination or a simulation examination may be necessary to fully assess candidates' clinical competencies. A third possibility might be that the most effective assessment can be made only by considering performance on all three types of examinations: written, oral/practical, and simulation.

Using the Role Delineation study, the CNCB Scientific Council sends a Validation Survey to randomly chosen professionals in the field of clinical nutrition. The survey asks these professionals to rate the importance and potential harm of each of the major Performance Domains as well as to predict the percentage of time devoted to it in the normal performance of job responsibilities.

>Construction of the Test Blueprint

In the next step, the results from both the Role Delineation study and the Validation Survey are used to construct a "blueprint" or a plan for the certification examination. The precise description of the profession that has been developed is translated directly into percentages of examination is closely linked to the content of the job.

>Item Development and Validation

The next stage in the development of the CCN Certification Examination is to develop items, or questions, that pertain to the areas of performance outlined in the test blueprint. With the help of content area experts, the Scientific Council develops psychometrically-valid test items. Stringent criteria are used by experts in developing and evaluating items. The content of each item must be well-documented and represent current best practice. Items must be clearly written and easily understood. Experts also classify items according to content area and cognitive level.

Three formal Item Validity Rating Scales are used to finalize test items. In order to be accepted, an item must be judged relevant to certification level performance. It also must be judged to tap knowledge critical in differentiating adequate from inadequate job performance. Finally, experts must judge that inadequate mastery of the knowledge covered in the items could result in performance errors that could cause harm. In addition to these validity scales, expert judges also review each item to assure that the correct answer has been accurately identified, that it does not discriminate against one group of examinees or another, and that all distractors (incorrect options) are plausible, but indeed wrong. The difficulty level of the item is also rated.

>Analysis of the Test Items

CNCB Scientific Council collects statistics about the performance of CCN Certification Examination questions as they are used on the examination. Referred to as item analysis, CNCB Scientific Council evaluates the difficulty of the question, the degree to which the question discriminates between knowledgeable and unknowledgeable candidates, and the effectiveness of incorrect response option relative to the correct answer.

Item analysis information plays a central role in revising questions and selecting questions of the highest quality when new versions of the examination are created. In this manner a test can be built to correspond to a specified difficulty level and to a desired level of reliability.

>Examination Development

Each version of the exam is created by randomly selecting the appropriate number of items from each content area, as specified in the test blueprint. The items are then incorporated into a preliminary examination, and this examination is reviewed by members of the CNCB knowledgeable about each content area for any duplication of items to evaluate whether any items may cause unforeseen problems. In essence, the item is again evaluated in terms of how psychometrically sound, fair, and content-valid it is with respect to the whole examination.

>Examination Review and Revision

As part of the item development procedures, the content area covered by each item is identified. When a new version of an examination is needed, a preliminary version is created by randomly selecting the appropriate number of items from each item pool for each content area, as specified in the test blueprint.

This preliminary version of a certification examination is then subjected to the scrutiny of content area experts. First, the entire examination is reviewed to identify items that are duplicates or that may present a problem. Second, even though each item has already been judged to be psychometrically sound, fair and content-valid, the same process used to screen items for the item pool is repeated by a second group of content experts. As in the development of the item pool, the content area experts must reach a consensus concerning the acceptability of each item. The use of Item Validity Rating Scales a second time provides further support for the acceptability of the item and documentation of its validity.

Following this, each item that has passed both the item development and test development review is reviewed a third and final time. Again, content area judges evaluate the validity, appropriateness for entry-level personnel, and correctness of each item.

At this point a final version of the examination has been developed. However, further safeguards are also built into the written examination to assure that certification candidates receive a content-valid examination. When examining a group of candidates' responses to one version of the certification examination, any items that might appear to be questionable could then be excluded. To elaborate, despite the rigorous screening procedures, any item may be

confusing to entry-level candidates that was not confusing to the expert judges. An indicator of this confusion could be that a large number of examinees' scores on that item might be dropped from the total score.

>Summary and Conclusions

The procedures used to develop the CCN Examination are accepted procedures for developing fair and content-valid examinations. Each step in the test construction process, from Role Delineation to acceptance of the final version of an examination, is carefully documented. Through multiple reviews by content and psychometric experts and the use of stringent criteria, the validity of each step in the test construction process is assured. Thus, when a final form of the examination is complete, it is judged to be valid.

Eligibility Requirement - USA Accredited College/University degrees and coursework accepted

CORE ACADEMIC REQUIREMENTS for the Certified Clinical Nutritionist (CCN™) Examination

POST GRADUATE STUDIES IN CLINICAL NUTRITION™ (PGSCN) PROGRAM: 56 Hours of online and additional study covering the specific body of knowledge represented by the scope of clinical nutrition practice, is required of all degrees prior to taking the CCN™ Examination. *Exception dependent upon CNCB approval of independent academic nutrition program (see C):*

A. A Bachelors of Science: For individuals holding a Bachelors of Science from a Regional, National, State and DETC Accredited University, the coursework below should be incorporated into the existing degree or taken as supplemental coursework prior to qualification for the CNCB's PGSCN online program.

Core Science Coursework: 3 course hours each required

Anatomy & Physiology
Human Biology
Chemistry
Biochemistry (pre-requisite organic chemistry)
Microbiology

Core Nutrition Coursework/or Equivalency (five courses needed - 3 course hours each required)

**Course titles may vary but must be equivalent.*

Introduction to Nutrition I
Nutrition II
Nutrition and Disease
Nutrition & Supplementation
Nutrition Assessment
Herbology
Nutrition Counseling Strategies
Nutrition and Aging

B. An Advanced Professional Degree in a Licensed Health Care Field: (Degree must include Core Science Coursework.)

For qualified health professionals in licensed categories, including but not limited to holders of MD, DO, DC, DDS, DPM, OD, RPh, PharmD, DPT, PA, RD, or a BS in nursing, 56 hours of online training in clinical human nutrition within the PGSCN program is required prior to examination. Naturopaths with a degree approved through the Council on Naturopathic Medical Education or licensed through the state are qualified for the PGSCN online program. Those individuals holding an Associates Degree in Nursing would be qualified after obtaining the Core Nutrition Coursework listed above. Individuals holding an MS degree in the field of Clinical Nutrition from a State, National or DETC college are qualified for the PGSCN online program.

C. An individual that holds a Masters, Ph.D, or D.Sc. in Human Nutrition: from a Regionally accredited institution. (Degree must include Core Science and Nutrition Coursework.)

Dependent upon CNCB approval of individual academic nutrition programs, Masters, Ph.D., and D.Sc. applicants may be eligible to take the examination without completion of the Post Graduate Studies in Clinical Nutrition (PGSCN) program. Current exemptions include Bridgeport University, New York Chiropractic College and UC Davis. An individual may request exemption if their MS degree is from another Regionally Accredited University, not currently listed.

D. Foreign Degree Applicants: submit satisfactory English documentation at applicant expense.

If the degree comes from outside the United States, it must be evaluated as being equivalent to United States accredited institution standards.

- Michigan requires Statistics coursework for licensure.
- Optional coursework but recommended: Medical Terminology, Practice Management/Insurance Codes, HIPPA requirements.

Applicant Responsibilities and Procedures

Responsibility:

- Assume responsibility for all forms and documentation required by the CNCB.
- Verify that all schools have mailed “official” transcripts.
- Verify that all recommendation letters have been received.
- Order all necessary study materials, allowing ample time for study prior to the exam.
- Credential Review Form must be in the Credential Review Office **30 days before beginning the PGSCN program.**
- A completed and notarized CCN Examination Application.

Procedures:

1. Apply to the Clinical Nutrition Certification Board (CNCB) Credentials Review Office by letter, for permission to register for the Post Graduate Studies in Clinical Nutrition (PGSCN) program.
2. The following forms are available online at www.cncb.org
 - Credentials Review Form.
 - Official CCN Examination Study Guide.
 - CNCB Credentials Review Check List
3. Order desired Post Graduate Studies Text and CCN Exam Text Study Materials.
4. Order two “official” transcripts from each graduating institution sent to the CNCB Credentials Review Office.
5. Send the CNCB Credentials Review Office all items on Credential Review Check List including the following:
 - Completed CCN Credentials Review Form (\$75.00 non-refundable credentials processing fee payable to CNCB).
 - Passport type photos (2).
6. After completion of the Post Graduate Studies Program and all required forms have been submitted to the CNCB send in the notarized CCN Exam Application for approval.
7. DEADLINE: 30 days before the desired examination date, the following must be received by the CNCB Credentials Office:
 - A completed and notarized CCN Examination Application (1 original, 1 photocopy).
8. Notification of examination approval will be provided to applicants by the Clinical Nutrition Certification Board. Notification of examination score will be provided by the CNCB Credentials Office.
9. An official numbered “Certified Clinical Nutritionist” Certificate will be provided by the CNCB. This Certificate will be updated every five years as part of The Re-Certification Program for CCNs.

Documentation Explanation

>Certified Clinical Nutrition Examination Application:

A correctly notarized examination application requires that you present your identification and the application to the notary in order that notarization be made. (Then a photocopy is made, and both the original and the copy are sent to the CNCB Credentials Office.)

>Diplomas or License as part of the Credentials Review Documentation:

Provide a copy of your diploma or license. For diplomas or license written in a foreign language , attach a notarized translation prepared by a board certified translator. Two copies of each diploma or license will be needed.

>Documentation of minimum three years work in field of Clinical Nutrition (if applicable):

Documentation of three years work in the field of clinical nutrition shall include, but not be limited to, notarized and authentic copies of federal, state, or local government business, professional, or occupational licenses, certificates, or permits; notarized statements from officials at financial institutions, insurance companies, and certified public accountants attesting to the nature and duration of the business or employment, that sufficiently demonstrates that the applicant was employed as a practitioner consultant of clinical nutrition for a minimum of three years. Letters of recommendation are important. These letters should include several clients, several supplier supplement companies, as well as other licensed health care practitioners with whom you have networked. Two copies of each will be needed. If you have developed any particular expertise or reputation in the broad field of clinical nutrition, or if you find that several particular areas appeal to you the most, leading to a specialty preference, please advise here. If you are sought out as a teacher or lecturer, please so advise, and advise what type of audiences you have taught.

The Examination

>Instructions

The questions on the CCN Examination are multiple-choice. The actual exam contains 150 questions with only one correct choice for each question. Carefully read each question and all of the choices before making a selection. You will have three hours to complete the exam.

When you take the exam, be sure to mark only *one* answer for each question, as questions with more than one choice selected will not count toward your final score.

You are advised to answer every question, since your final score will be determined by the total number of correct answers. *There is no penalty for guessing.*

>Major Categories of the Examination

PERFORMANCE DOMAIN	% of Exam	Questions
I. Basic Knowledge Related to Nutrition	22%	33
II. Nutrition Assessment and Evaluation	18%	27
III. Nutrition Counseling and Case Management	14%	21
IV. Professional Practice Management	2%	3
V. Professional Responsibility	2%	3
VI. Optimal Human Nutrition (PGSCN online program)	10%	15
VII. Cognition & Sensory Overload (PGSCN online program)	10%	15
VIII. Detoxification, Herbology and Homeopathic Therapy (PGSCN online program)	10%	15
IX. Laboratory Assessment (PGSCN online program)	12%	18
Total Number of Items		150

>Specific Breakdown of Examination Content

PERFORMANCE DOMAIN I: BASIC KNOWLEDGE RELATED TO NUTRITION

(There are 33 questions relating to this domain on the exam.)

TASK 1: Demonstrate proficiency in basic concepts of human physiology derived from medical/scientific literature in order to properly evaluate and counsel clients/patients.

•Knowledges:

1. Basic knowledge of anthropomorphic measurements.
2. Basic knowledge of metabolic pathways.
3. Basic knowledge of detoxification and excretion systems.
4. Basic knowledge of immune system functions.
5. Basic knowledge of digestive and absorptive functions.
6. Basic knowledge of endocrine & exocrine organs, liver and kidneys, and other organ functions.
7. Basic knowledge of neural transmitters
8. Basic knowledge of inborn errors of metabolism relating to nutrient imbalances (PKU, histadenic vs. histaminic, acidosis vs. alkalosis, etc.).
9. Basic knowledge of physiological differences in pediatrics.
10. Basic knowledge hormonal influences on metabolism of foodstuffs, and effects on nutritional status.
11. Basic knowledge the physiological models of obesity.
12. Basic knowledge reproductive functions for both genders, including pregnancy and lactation.
13. Basic knowledge altered metabolic, hormonal, and nutritional pathways of disease states and iatrogenic modalities (e.g., surgery, chemotherapy, etc.).
14. Basic knowledge nutrition and pregnancy and lactation
15. Basic knowledge disease states
16. Basic knowledge nutritional management in surgery.
17. Basic knowledge energy metabolism.
18. Basic knowledge alcohol metabolism.

19. Basic knowledge nutrition and mental retardation.
20. Basic knowledge hormonal control of nutrient metabolism.
21. Basic knowledge protein synthesis and breakdown.
22. Basic knowledge synthesis, breakdown conversions, and actions of lipids, including prostaglandins, steroids, bile, lipoproteins, phospholipids, etc.
23. Basic knowledge risk factors for development of illness.
24. Basic knowledge allergic responses in the body.
25. Basic knowledge of vital signs assessment.

TASK 2: Demonstrate knowledge of basic human anatomy by utilizing medical texts in order to properly evaluate and counsel clients/patients.

•**Knowledges:**

1. Basic knowledge of identity and structure of digestive organs and systems.
2. Basic knowledge of identity and structure of cellular components of visceral organs.
3. Basic knowledge of identity of immune system organs.
4. Basic knowledge of identity of the cardiovascular system.
5. Basic knowledge of functional assessment of autonomic nervous system (Heart rate variability, testing and measurement)
6. Basic knowledge of identity of brain and nervous system.
7. Basic knowledge of identity the musculoskeletal system.
8. Basic knowledge of identity and structure of cell types in connective tissues.
9. Basic knowledge of identity and structure of cell types in the immune system.
10. Basic knowledge of identity and structure of cell types in the nervous system.
11. Basic knowledge of identity and structure of blood and bone marrow.
12. Basic knowledge of identity, structure, and anatomical differences between smooth, skeletal, and myocardial muscles.
13. Basic knowledge of annual anthropomorphic.

TASK 3: Utilize knowledge of nutrient roles and functions taken from medical/scientific literature to evaluate and counsel clients/patients.

•**Knowledges:**

1. Basic knowledge of minerals and their functions, including the macrominerals and their functions, including macrominerals and trace minerals.
2. Basic knowledge of vitamins, including the fat soluble vitamins (A, D, E, and K), the water soluble, and the B vitamins.
3. Basic knowledge of carbohydrates (simple, complex, and refined) and fiber (soluble and insoluble).
4. Basic knowledge of proteins: amino acids and their functions, polypeptides, etc.
5. Basic knowledge of fats: saturated, unsaturated (Omega 6'2, Omega 3's), and transisomers (partially hydrogenated).
6. Basic knowledge of water, its uses and needs in the body, processed waters (distilled, spring, city waters), and pollution problems.
7. Basic knowledge of Phytonutrients sources and uses.
8. Knowledge of heavy metals (lead, mercury, cadmium, aluminum, etc.) and their effect on nutrients and health.
9. Knowledge of specific, naturally-occurring compounds in foodstuffs and their actions (e.g., bioflavonoids).
10. Knowledge of metabolic intermediates as nutrients, and their roles and actions (e.g., coenzyme Q10).
11. Knowledge of identity, actions, and toxicities of botanicals (herbals) commonly used in foodstuffs.
12. Knowledge of signs, symptoms, and effects of nutrient deficiencies and excesses.
13. Knowledge of common food additives, colors, and preservatives.
14. Knowledge of food preparation techniques and methods and their effect on nutrient content of foods.
15. Knowledge of nutrient content of foods from published tables or computer programs.
16. Basic knowledge of enzymes, both metabolic enzymes and nutritional (food) enzymes.

TASK 4: Know human nutritional requirements in order to provide guidelines to clients/patients by utilizing information from medical/scientific literature.

•**Knowledges:**

1. Knowledge of the effects of exercise on nutritional requirements and status (Sports Nutrition).
2. Knowledge of mineral requirements for various age groups.
3. Knowledge of vitamin requirements for various age groups.
4. Knowledge of water intake requirements for various age groups.
5. Knowledge of the effects of nutritional requirements of exercise, aging, minor illness or injury, major illness or injury, environment, temperature, religious beliefs, ethnic customs, altitude, inactivity, psychological influences (anorexia, bulimia, overeating).
6. Knowledge of protein quantity and quality and quality requirements for various age groups.
7. Knowledge of requirements of fat quality and quantity for various age groups.
8. Knowledge of carbohydrate requirements (quantity and quality) for various age groups.
9. Knowledge of the effects on food quality due to refining/processing and soils in which crops are grown.
10. Knowledge of the effects of pregnancy and lactation on nutritional status of mother and offspring (fetal, neonatal, infant, toddler).
11. Knowledge of unique requirements of nutrition for mental retardation and psychiatric illnesses.
12. Knowledge of nutrient deficiencies and excesses.

TASK 5: Understand the effects of nutritional imbalances (deficiencies and excesses) by use of clinical evaluations and research findings.

•**Knowledges:**

1. Knowledge of nutritional status assessment and assessment procedures.
2. Knowledge of assessment procedures and interpretation of blood chemistry, complete blood counts.
3. Knowledge of assessment procedures and interpretation of urine analysis.
4. Knowledge of assessment procedures and interpretation of amino acid, organic acid and fatty acid analysis.
5. Knowledge of assessment procedures and interpretation of vitamin assays.
6. Knowledge of assessment procedures and interpretation of mineral assays.
7. Knowledge of assessment procedures and interpretation of heavy metals analysis.
8. Knowledge of assessment procedures and interpretation of immune assays.
9. Knowledge of assessment procedures and interpretation of allergy assays.
10. Knowledge of assessment procedures and interpretation of microbiological assays.
11. Knowledge of assessment procedures and interpretation of metabolic intermediates.
12. Knowledge of assessment procedures and interpretation of alcohol and drug testing.
13. Knowledge of assessment procedures and interpretation of hormone assays.
14. Knowledge of assessment procedures and interpretation of malnutrition (starvation, Protein-Calorie Malnutrition).
15. Knowledge of assessment procedures and interpretation of over consumption (obesity).
16. Knowledge of assessment procedures and interpretation of enzyme assays.
17. Knowledge of assessment procedures and interpretation of single or combination supplemented nutrients upon human biochemistry.
18. Knowledge of assessment procedures and interpretation of heart rate variability.

TASK 6: Demonstrate knowledge of medical and scientific terminology in order to obtain information from textbooks in order to assimilate findings from medical/scientific literature.

•Knowledges:

1. Knowledge of medical and scientific terminology.
2. Knowledge of chemical names.
3. Knowledge of obtaining scientific journals and newsletters. (Use of computer search engines for research)
4. Knowledge of scientific and common names of nutrients and synonyms.
5. Knowledge of basic scientific units of measurements.
6. Knowledge of food-stuff descriptions for use in dietary analysis.

-Skills:

1. Skill in verbal communications.
2. Skill in interpreting scientific literature.
3. Skill in correct spelling of root words used in medical and scientific terminology.
4. Skill in using available medical and university libraries for obtaining needed information and textbooks.

TASK 7: Demonstrate a basic knowledge of pharmacologic and environmental effects upon nutritional status by utilizing findings from medical/scientific literature in order to more fully evaluate clients/patients.

•Knowledges:

1. Knowledge of effects of pharmaceuticals on nutritional status.
2. Knowledge of effects of Xenobiotics and excitoxins on nutritional status.
3. Knowledge of effects of chemical pollution of air, water, food, etc. on nutritional status.
4. Knowledge of effects of industrial and household chemical exposure on nutritional status.
5. Knowledge of effects of electromagnetic field exposure on nutritional status.
6. Knowledge of effects of high-energy radiation sources on nutritional status.
7. Knowledge of effects of psychogenic stress on nutritional status.
8. Knowledge of effects of inhaled, ingested, or topical allergen exposure on nutritional status.
9. Knowledge of effects of infectious and non-infectious diseases on nutritional status.
10. Knowledge of effects of nicotine and tobacco use on nutritional status and long-term health.
11. Knowledge of effects of alcohol on nutritional status, including fetal alcohol syndrome.
12. Knowledge of effects of naturally-occurring toxins in foods on nutritional status.
13. Knowledge of effects of vaccinations and immunizations on short and long-term nutritional status.

TASK 8: Understand effects of socioeconomic influence on nutritional status of clients/patients by familiarization with literature findings in order to effectively evaluate and instruct clients/patients.

•Knowledges:

1. Knowledge of ethnic eating customs.
2. Knowledge of effects of socioeconomic status on nutritional intake and status.
3. Knowledge of various eating habits of religious groups.
4. Knowledge of nutritional effects of personal food selection (i.e., strict vegetarians).
5. Knowledge of eating disorders and their effects upon nutritional status.
6. Knowledge of geographical soil parameters (depletions and deficiencies) which may affect the mineral and nutrient content of foods grown and consumed in a given geographical area, thereby affecting the health of the public in general living in that area.

PERFORMANCE DOMAIN II: NUTRITIONAL ASSESSMENT & EVALUATION

(There are 27 questions relating to this domain on the exam.)

TASK 1: Obtain and record accurate chronological case history and dietary data (food and dairy) from client/patient interview by both verbal and written means, in order to ascertain factors that may influence the client's/patient's condition.

•Knowledges:

1. Knowledge of interview techniques.
2. Knowledge of written Health Survey assessment questionnaires.
3. Knowledge of computer based assessment programs.
4. Knowledge of medical history and related medical test results.
5. Knowledge of family history related to present or previous medical conditions or illness.
6. Knowledge of present/past emotional or stress-related personal and work history.
7. Knowledge of client's/patient's present and past dietary history (including food diary and dietary supplements taken).
8. Knowledge of client's/patient's chief complaints and current symptoms.
9. Knowledge of collecting, organizing, and correlating pertinent health data.
10. Knowledge related to interpersonal communication to maximize accurate data collection.

-Skills:

1. Skill in record-keeping, storage of information.
2. Skill in asking proper questions and listening carefully to elicit accurate information during the interview.
3. Skill in recording and processing data from assessment questionnaires.

TASK 2: Select appropriate clinical tests based on previous collected data in order to document and/or confirm suspected nutritional deviations/abnormalities.

•Knowledges:

1. Knowledge of pertinent annual measurement of anatomical characteristics relevant to nutritional status, i.e., weight, height, posture, body fat, musculature.
2. Knowledge of pertinent clinical blood, serum, or plasma tests (will include chemistries, hematology, serology, immunology, etc.).
3. Knowledge of pertinent tissue (hair and packed cell) mineral analysis.
4. Knowledge of urine testing.
5. Knowledge of saliva tests.
6. Knowledge of perspiration tests.
7. Knowledge of vital signs.
8. Knowledge of blood cell tests.
9. Knowledge of stool tests.
10. Knowledge of blood group, type, and Rh status.
11. Knowledge of metabolic rate assessment.
12. Knowledge of body typing (i.e., endomorph, ectomorph).
13. Knowledge of other diagnostic tests (i.e., radiographs) related to nutritional assessment.
14. Knowledge of blood allergy testing.
15. Knowledge of provocative allergen testing.
16. Knowledge of functional assessment of autonomic nervous system (heart rate variability measurement or testing).

-Skills:

1. Skill in selecting and identifying appropriate tests from data collected.
2. Skills in ordering appropriate test.
3. Skill in recording and interpreting previous test results in order to know which additional testing to recommend.

TASK 3: Determine nutritional status of client/patient by assessing deviation from normal ranges by objective measurable changes in physical and biochemical characteristics (e.g., weight; posture; appearance of nails, skin, and hair; old lab tests; etc.) in order to select further confirmatory diagnostic tests.

•Knowledges:

1. Knowledge of normal and optimal (healthy) ranges for clinical laboratory tests.
2. Knowledge of effects of deviation from normal values on nutritional status for clinical laboratory tests.
3. Knowledge of the physical signs of abnormal gastrointestinal, pancreatic, and hepatobiliary functions.
4. Knowledge of effects of deviation from normal metabolic, physical, bioelectrical and case historical findings on nutritional status.
5. Knowledge of the physical signs of abnormal cardiovascular and pulmonary function.
6. Knowledge of physical signs of abnormal endocrine and neurologic functions.
7. Knowledge of physical signs of abnormal genito-urinary functions.
8. Knowledge of physical signs of abnormal immunologic, hematopoietic, and lymphatic function.
9. Knowledge of physical signs of abnormal musculoskeletal, integumentary, and connective tissue function.
10. Knowledge of assessing dietary intake.
11. Knowledge of clinical laboratory tests for determining nutritional status and nutrient levels.
12. Knowledge of anthropometric measurements and their relation to nutritional status (e.g., percent body fat, body mass index).
13. Knowledge of alternative evaluation techniques (i.e., homeopathic interrogation, acupuncture meridian interrogation, kinesiology, chelation therapy, Herbology, reflexology, allergic food provocation testing, electromagnetic frequency challenge) as related to nutritional assessment.

-Skills:

1. Skill in anthropometric measurements.
2. Skill in obtaining adequate data relating to nutritional abnormalities.
3. Skill in identifying abnormalities from collected data.

TASK 4: Evaluate and interpret clients'/patients' clinical data by careful analysis and applying clinical judgment in order to formulate an appropriate nutritional protocol.

•Knowledges:

1. Knowledge of parameters (including normal and deviations from normal) of scientifically standardized tests.
2. Knowledge of factors that could influence or alter results of selected tests.
3. Knowledge of pathological conditions associated with abnormalities which may become apparent as a result of tests.
4. Knowledge of test data to determine therapeutic approach.
5. Knowledge of evaluating changes due to therapeutic program and knowledge to make necessary alterations to therapy.
6. Knowledge of pathological findings that would indicate the need for referring a client.
7. Knowledge of differentiating laboratory results based upon age, sex, and race.
8. Knowledge of communicating test findings to client/patient.

-Skills:

1. Skill in communicating laboratory results to others.
2. Skill in writing a narrative report of laboratory results.
3. Skill in deducing nutritional status from correlating assessments.
4. Skill in determining when a need for referral exists.
5. Skill in determining when a need for parenteral routes of nutrient administration exists.
6. Skill in knowing when a test is erroneous and does not fit the clinical picture.
7. Skill in knowing how to integrate all of the clinical data together in a concise, logical, comprehensive fashion and then to formulate a plan of feasible recommendations from the data.

PERFORMANCE DOMAIN III: NUTRITIONAL COUNSELING & CASE MANAGEMENT

(There are 21 questions relating to this domain on the exam.)

TASK 1: Effectively communicate to the client/patient the importance of food selection (i.e., determining the type, amounts, preparation methods, and appropriate combining of different foods in the diet) in order to achieve a mix of nutrients from these foods as ideally balanced as possible.

•Knowledges:

1. Knowledge of nutritive content of organic and commercial foods (types and amounts of nutrients contained in commonly available foods) based on current data.
2. Knowledge of the effect of food storage, food handling, preparation methods, and food combining on the availability of nutrients from foods.
3. Knowledge of the effect of contaminants in food and water on health and on the availability and utilization of nutrients from foods.
4. Knowledge of the impact of different food types on various illness states.
5. Knowledge of the impact of pharmaceuticals on the availability and utilization of nutrients from foods.
6. Knowledge of the individual biochemical variability and its effect on food recommendations.
7. Knowledge of the health benefits to be derived from the as yet unrecognized trace nutrients or non-nutritive components of whole foods and minimally processed foods.
8. Knowledge of the relative merits of obtaining nutritional requirements from whole foods rather than from nutritional supplements.
9. Knowledge of the feasibility of using dietary manipulation to reduce pharmaceutical requirements.
10. Knowledge of the difference between the RDA for nutrients published by the government and optimum nutrient requirements to attain or maintain good health.
11. Knowledge of additives to foods (Sulfites, nitrates, nitrites, MSG, artificial sweeteners and flavor enhancers, etc.)
12. Knowledge of fad diets and other food and health claims.
13. Knowledge of the interaction of certain foods and food groups which may produce adverse or allergic reactions to sensitive individuals.
14. Knowledge of effectively choosing alternative foods or food groups for individuals who are intolerant to certain foods (i.e., lactose intolerance, sucrose intolerance, gluten intolerance, etc.).
15. Knowledge of specific diets for different metabolic disorders or disease states (i.e., diabetes, renal failure, advanced atherosclerosis, PKU, etc.).

-Skills:

1. Skill in now talking “over the clients’/patients’ head” or not oversimplifying when explaining the nutrient value of foods.
2. Skill in reading and comprehending, on an on-going basis, the data in the nutrition and general medical research literature.
3. Skill in giving instruction for nutritional management (motivating clients to comply with dietary modifications).
4. Skill in instructing the client as to how his or her body responds biochemically and physiologically.

TASK 2: Recommend to the client/patient, via a written list, the types, amounts, and method of administration of nutritional supplements to use in addition to foods, in order to achieve optimum nutrient intake and utilization.

•Knowledges:

1. Knowledge of the commercially available food supplements, herbs, and homeopathic remedies; their relative purity; and cost effectiveness.
2. Knowledge of the suitability of individual supplemental nutrients (or mixtures of such nutrients) for use by an individual, relative to his or her lifestyle.
3. Knowledge of the effects of very high dose supplementation of individual nutrients on client/patient health.
4. Knowledge of which nutrients are commonly inadequately supplied by a well-balanced diet.
5. Knowledge of the amounts and types of supplemental nutrients that have been found beneficial for various diseases.
6. Knowledge of how different nutrients can be used to prevent illness.
7. Knowledge of the conditions (such as heat, light, and oxygen exposures, etc.) affecting safety and potency of

various nutrients.

8. Knowledge of the interactions between nutrients.
9. Knowledge of individual biochemical variability and its effect on supplemental nutrient recommendations.
10. Knowledge of the severe debilitated state of a client, wherein tube or parenteral feeding is required and referral to other medical professions is warranted.
11. Knowledge of uses, effects, toxicities, and suitability of botanicals as nutritional supplements.
12. Knowledge of official homeopathic remedies, their uses, effects, manufacture, and suitability as nutritional supplements.

-Skills:

1. Skill in selecting nutrients, herbs, and other remedies based on cost effectiveness, estimated client/patient compliance, and client/patient tolerance.
2. Skill in relating the relevant importance of supplement use.
3. Skill in motivating the client/patient to comply with the supplemental regimen recommended.
4. Skill in explaining why supplements would be beneficial to the client/patient.
5. Skill in explaining why a certain supplement may be harmful to the client/patient (i.e., certain single or combination supplements may negate necessary pharmaceuticals the patient may be taking).

TASK 3: Instruct the client/patient in the importance of implementing various lifestyle modifications and the benefits to health of these modifications in order to augment the nutritional regimen.

•Knowledges:

1. Knowledge of the detrimental effects of tobacco exposure.
2. Knowledge of the detrimental effects of alcohol abuse.
3. Knowledge of the detrimental effects of recreational and prescription drug use.
4. Knowledge of the detrimental effects of sugar, artificial sweeteners, flavor enhancers, trans- fats, etc.
5. Knowledge of the beneficial effects of appropriate exercise.
6. Knowledge of the beneficial effects of stress reduction techniques.
7. Knowledge of the beneficial effects of proper nutrition.
8. Knowledge of available literature resources on nutrition.
9. Knowledge of the public health and public safety guidelines.
10. Knowledge of psychoneuro-immunological issues.
11. Knowledge of unique nutritional requirements for sports nutrition and ability to recommend dietary programs for specific athletic endeavors (i.e., long-distance running, weight gain, etc.).
12. Knowledge of fad diets, health frauds, and other unsupported health claims.

-Skills:

1. Skill in verbal and written communication of concepts related to lifestyle modifications.

TASK 4: Re-evaluate the client's/patient's nutritional status and progress since prior recommendations (by repeating appropriate evaluative techniques) in order to modify, if necessary, the treatment protocol.

•Knowledges:

1. Knowledge of previous test results, previous evaluations and the implication and presentation of these results.
2. Knowledge of nutritional evaluation and assessment techniques.
3. Knowledge of the client's/patient's goals at the initial evaluation.
4. Knowledge of the options for modifications of client/patient program.
5. Knowledge of nutrition concepts applicable to client's/patient's immediate needs.
6. Knowledge of nutrition concepts applicable to long-term health.
7. Knowledge of the time-frame within which different nutrients act beneficially.
8. Knowledge of how to properly interpret and manage any adverse reaction or irritation experienced by the patient during the course of the recommended nutritional program and how to correct or circumvent such problems.

-Skills:

1. Skill in communication adequate to convey information regarding the necessity of re-evaluation to improve client/patient nutritional status.
2. Skill in interpreting test results and changes in symptomatology.

TASK 5: Educate the client/patient and family/"significant others" by revealing to them the impact of nutrition and lifestyle on their present and future health condition in order to equip the client/patient with information and skills to implement the nutritional and lifestyle modifications program.

•Knowledges:

1. Knowledge of the client's/patient's goal for his or her future health including the client's/patient's priorities.
2. Knowledge and understanding by the nutritionist of the client's/patient's present health condition.
3. Knowledge of nutrition and lifestyle research data in the literature relative to a particular client's/patient's health problems and future health risks.
4. Knowledge of the learning skills that the client/patient possesses and can utilize in the educational process.
5. Knowledge of client's/patient's present understanding of his or her health and nutritional status (where he/she is starting in the educational process).
6. Knowledge of appropriate frequency of follow-up visits to optimize learning and compliance.
7. Knowledge of the client's/patient's financial resources, time limitations, and other factors that would affect their acceptance of taught materials and affect the frequency of educational sessions.

-Skills:

1. Skill in communication (at a level that the client/patient will understand) to convey client/patient test results, appropriate research data, etc., with the goal of getting the client/patient motivated enough to accept and implement nutritional and lifestyle modification recommendations.
2. Skills in "reading the client/patient" to know by facial expressions, body language, etc., when they appear resistant to accepting a certain concept or they do not understand something being taught.
3. Skill in listening and questioning the client/patient to know when he/she comprehends.

TASK 6: Instruct the client/patient on the importance of complying with the nutritional and lifestyle modifications (by conveying relevant nutritional research information and instilling faith into the client/patient that such information is applicable to themselves) in order to motivate the client/patient and thus achieve success in implementing the nutritionist's recommendations.

•Knowledges:

1. Knowledge of ramifications of client/patient compliance or non-compliance.
2. Knowledge of the necessity to follow-up visits in fine-tuning a program.
3. Knowledge of sources of possible obstacles or reactions occurring during the course of a program which may cause the patient to become discouraged or to discontinue the program.
4. Knowledge of additional client/patient materials (i.e., books, videotapes, newsletters, visual aids) which augment client/patient understanding.
5. Knowledge of realistic expectations for the outcome of the program.
6. Knowledge of the general motivation skills applicable to different client/patient personalities.

-Skills:

1. Skill in persuasion related to conveying importance of compliance.
2. Skill in motivating related to compliance.

TASK 7: Determine when it is necessary or prudent (because of the limitations of the nutritionist's skills or because of the inadequacy of nutritional intervention in correcting the client's/patient's problems, etc.) to refer the client/patient to another health care professional in order to provide better care for the client/patient.

•Knowledges:

1. Knowledge of when nutritional intervention is inappropriate for a particular client/patient as a sole treatment modality.
2. Knowledge of when to refer a client/patient to another health care professional because of enhanced treatment potential outside the realm of nutrition.
3. Knowledge of intrapersonal conflicts which would compromise the effectiveness of a nutritional intervention program.

-Skills:

1. Skill to discern those circumstances under which initial nutrition counseling (or further nutritional counseling) does not appreciably enhance the health status of the client/patient.
2. Skill in communication, in a non-threatening manner, the need to alter the relationship of nutrition counselor to the client/patient.
3. Skill in identifying a critical medical problem or a problem requiring immediate attention by another health care professional.

PERFORMANCE DOMAIN IV: PROFESSIONAL PRACTICE MANAGEMENT

(There are 3 questions relating to this domain on the exam.)

TASK 1: Effectively manage an office and its staff by utilizing appropriate managerial skills (i.e., scheduling appointments, accounting procedures, and general staff management) in order to insure the smooth operation of the professional practice.

•Knowledges:

1. Knowledge of time management requirements.
2. Knowledge of staff management and training.
3. Knowledge of basic state and federal laws.
4. Knowledge of office procedures.
5. Knowledge of in-office client/patient procedures.
6. Knowledge of record keeping, filing, accounting, bookkeeping, and payroll procedure.
7. Knowledge of medical/nutritional terminology and nomenclature.
8. Knowledge of nutritional supplements and related information.
9. Knowledge of specific testing information (including equipment needed in the office for on-site testing as well as where to send the patient for off-site testing).
10. Knowledge of appropriate client/patient scheduling procedures.
11. Knowledge of product purchasing/stocking and inventory control.
12. Knowledge of how to properly process insurance claims (i.e., sources of correct forms, diagnostic and CPT codes) and how to obtain diagnoses and referral forms from appropriate health care professionals to properly file insurance claims.

TASK 2: Learn what laws and liability insurance are applicable to the practice of nutrition by reading the appropriate state and/ or federal codes, statutes, and laws (and, if necessary, seeking legal counsel) in order to insure the nutrition practice against failure from the neglect of such laws.

•Knowledges:

1. Knowledge of Medical Practice Act in relation to nutritional practice.
2. Knowledge of state licensing laws.
3. Knowledge of use of release forms.
4. Knowledge of use of consent forms.
5. Knowledge of use of disclaimers.
6. Knowledge of insurance coverage and laws.
7. Knowledge of limitations/boundaries of the clinical nutrition practice.
8. Knowledge of the legal implications of the claims made by the clinical nutritionist to the client/patient.
9. Knowledge of liability insurance for the practitioner (malpractice insurance).
10. Knowledge of applicable insurance coverage's.
11. Knowledge about how to acquire the current applicable legally-approved forms, and create new forms for use in

- the nutrition practice (i.e., release forms, consent forms, disclaimers, etc.).
12. Knowledge of confidentiality issues.
 13. Knowledge of copyright laws relating to practice forms and marketing materials.

TASK 3: Establish a professional network by initiating effective communication with other health care professionals (MD, DDS, DC, DO, DPM, CHT, etc.) and by establishing professional health care affiliations to insure the best interest or the client's/patient's health care and to help build the nutrition practice.

•Knowledges:

1. Knowledge of proper professional ethics in the referral process.
2. Knowledge of proper referral base (to and from) and their areas of expertise.
3. Knowledge of professional etiquette in the networking process.
4. Knowledge of working relationship with any other health care provider (i.e., protocol, financial incentive, P.R.).
5. Knowledge of transfer of documentation between referring physician and clinical nutritionist.

-Skills:

1. Skill in communicating effectively with others.

TASK 4: Develop and establish the practice of the clinical nutritionist, in order to maintain a successful practice, by public exposure through effective mass media communication, written publication, and lecture/exams.

•Knowledges:

1. Knowledge of marketing skills and target markets.
2. Knowledge of creating promotional materials.
3. Knowledge of selective advertising.
4. Knowledge of creating and developing your specialty image.
5. Knowledge of what is needed to communicate effectively to build a practice.
6. Knowledge of copyright laws.
7. Knowledge of current public interest.
8. Knowledge of effective communication tools.
9. Knowledge of available public forums.

-Skills:

1. Skill in determining clients'/patients' adherence to suggested dietary and lifestyle modifications.

PERFORMANCE DOMAIN V: PROFESSIONAL RESPONSIBILITY

(There are 3 questions relating to this domain on the exam.)

TASK 1 Read current nutrition literature and meet the annual requirements for continuing education by attending courses offered by the association for clinical nutritionists, in order to seek the highest level of professional competency on an ongoing basis.

•Knowledges:

1. Knowledge of how many hours of continuing education per year are necessary.
2. Knowledge of current literature in fields related to clinical nutrition.
3. Knowledge of current literature in clinical nutrition.
4. Knowledge of IAACN approved courses applicable to continuing education.

-Skills:

1. Skill in communications with CNCB.

TASK 2 Practice responsible, ethical, and legal nutrition counseling in the day to day operations (by demonstrating proficiency in daily practicing the use of CNCB Code of Ethics and Professional Responsibility) in order to achieve and maintain the respect and confidence of the public, our peers, and fellow nutritionists.

•**Knowledges:**

1. Knowledge of State Laws and regulations governing the practice of clinical nutrition in the practitioner's home state.
2. Knowledge of Federal Laws and regulations governing the practice of clinical nutrition in the practitioner's home state.
3. Knowledge of CNCB code of ethics.
4. Knowledge of professional responsibility.

TASK 3 Critically evaluate published nutrition research by applying the scientific methods of study design and statistical analysis in order to better evaluate the applicability of published research studies in the day to day practice of nutrition.

•**Knowledges:**

1. Knowledge of different types of research study designs and protocols.
2. Knowledge of basic concepts of statistical analyses (especially null hypothesis).
3. Knowledge of client/patient selection techniques.
4. Knowledge of proper form and order of presentation in research papers.
5. Knowledge of principles of deductive and inductive reasoning.
6. Knowledge of common pitfalls in research studies.
7. Knowledge of limitations of research results.
8. Knowledge of the best quality journals and other sources of published nutritional research.
9. Knowledge of use of computer aided literature search for names, references, articles, and images.

-**Skills:**

1. Skill in drawing applicable information from the literature to use in clinical nutrition practice.
2. Skill in appropriately critiquing articles in the field of nutrition.
3. Skill in utilizing basic statistical knowledge in analyzing research studies.

PERFORMANCE DOMAIN VI: OPTIMAL HUMAN NUTRITION - PGSCN SESSION I

(There are 15 questions relating to this domain on the exam.)

Knowledges:

1. Knowledge of the biochemistry of Essential Vitamins.
2. Knowledge of the biochemistry of Essential Minerals.
3. Knowledge of the biochemistry of Essential Trace Minerals.
4. Knowledge of the biochemistry of Essential Amino Acids & Accessory Nutrients.
5. Knowledge of Optimal Human Nutrition.
6. Knowledge of Environmental Health Issues.
7. Knowledge of Drug Induced Nutritional Deficiencies.

PERFORMANCE DOMAIN VII: COGNITION AND SENSORY OVERLOAD - PGSCN SESSION II

(There are 15 questions relating to this domain on the exam.)

Knowledges:

1. Knowledge of Free Radicals and Antioxidants.
2. Knowledge of the Biochemistry of Fats and Oils.
3. Knowledge of client/patient selection techniques.
4. Knowledge of the Human Microflora.
5. Knowledge of Cognitive Enhancing Drugs & Nutrients.
6. Knowledge of Alternative Cancer Therapies.
7. Knowledge of Women's Health Conditions.

8. Knowledge of Cardiovascular Disease.
9. Knowledge of Hyperinsulinemia.
10. Knowledge of Allergies and Asthma.
11. Knowledge of ADD and ADHD.
12. Knowledge of Assessment & Medical Symptom Questionnaires.

PERFORMANCE DOMAIN VIII: DETOXIFICATION, HERBOLOGY

AND HOMEOPATHIC THERAPY - PGSCN SESSION III

(There are 15 questions relating to this domain on the exam.)

Knowledges:

1. Knowledge of Human Toxicity.
2. Knowledge of Bowel Terrain.
3. Knowledge of toxic conditions, allergies and sensitivities.
4. Knowledge of requirements needed for detoxification.
5. Knowledge of Therapy Modality; Homeopathy, Phytotherapy.
6. Knowledge of Therapy Modality; Herbology.
7. Knowledge of limitations of research results.
8. Knowledge of counseling using Alternative Therapies and Clinical Nutrition.

PERFORMANCE DOMAIN IX: LABORATORY ASSESSMENT – PGSCN SESSION IV

(There are 18 questions relating to this domain on the exam.)

Knowledges:

1. Knowledge of the rationale needed for Laboratory Assessment.
2. Knowledge of Vitamins as related to Enzymes.
3. Knowledge of Mineral Laboratory Testing.
4. Knowledge of Amino Acid Laboratory Testing.
5. Knowledge of Fatty Acid Laboratory Testing.
6. Knowledge of Organic Acid Laboratory Testing.
7. Knowledge of Gastrointestinal Disorder Laboratory Testing.
 - a. Digestion & Absorption Testing.
 - b. Microbial Flora Testing.
 - c. Gastric and Pancreatic Function Testing.
 - d. Intestinal Function & Permeability.
 - e. Leaky Gut Syndrome.
 - f. Dysbiosis.
 - g. Bacterial & Protozoal Markers.
 - h. Food Allergy & Test Results.
8. Knowledge of Detoxification Testing.
 - a. Urinary Markers.
9. Knowledge of Hormones and Laboratory Testing.
10. Knowledge of Aging and Oxidant Stress Testing.
11. Knowledge of Urinary Metabolic Markers.
12. Knowledge of Case Reports and Case Outcomes.

Sample Questions:

1. Red cell transketolase is a functional enzyme test used to evaluate a nutritional deficiency for?
 - a) Vitamin B1
 - b) Vitamin B2
 - c) Vitamin B3
 - d) Vitamin B6

2. Tocotrienols are
 - a) Members of the B-vitamin family of nutrients
 - b) Members of the vitamin E family of nutrients
 - c) Members of the ascorbate complex family of nutrients
 - d) Precursors to the prostaglandins

3. In 1993, an employee of a Hair Analysis laboratory used that technology to compare the nutritional content of organically grown foods with commercially grown foods. In this study, organically grown foods were found to have _____ times greater nutritional density than organically grown foods.
 - a) 10
 - b) 4
 - c) 6
 - d) 2

4. What is the name of the fatty acid with the following nomenclature: 20:5n-3
 - a) Arachidonic acid
 - b) Docosahexaenoic acid
 - c) Gamma-linolenic acid
 - d) Eicosapentaenoic acid

5. Which of the following terms is a measure of inflammation?
 - a) Homocysteine
 - b) Fibrinogen
 - c) C-Reactive Protein
 - d) Oxidized LDL cholesterol

6. In a study of 116 ADHD children, what percentage were found to be magnesium deficient?
 - a) 95%
 - b) 75%
 - c) 50%
 - d) 25%

7. For eye disorders including myopia, diabetic retinopathy or cataracts, which herb(s) will be prescribed?
1. Kava Kava
 2. Ginger
 3. Garcinia Cambogia
 4. Bilberry
- a) 1
b) 2
c) 3
d) 4
8. Please indicate which of the following statements is true.
- a) High levels of uric acid are associated with constipation
 - b) High levels of uric acid are associated with gout
 - c) High urine protein is associated with a person who does not exercise
 - d) High urine protein is associated with the consumption of red meat
9. What is the interaction of mercury and immunoglobulin A ?
- a) IGA can bind to mercury
 - b) Mercury poisoning produces IGA
 - c) IGA protects the brain from mercury poisoning
 - d) IGA will clear up the irritable bowel syndromes caused by mercury poisoning
10. Iron deficiency causes:
- a) Cancer
 - b) Proliferation of T-cells
 - c) Blood loss
 - d) Oxidative stress
11. Ginkgo Biloba exerts its antidepressant effect through which of the following mechanisms
- a) Upregulation of Serotonin transport
 - b) Improvement in norepinephrine production centrally
 - c) Modulation of the PA axis through sensitization of corticoid receptors
 - d) Reduction in cerebral hypoxia and reversal of vascular insufficiency
 - e) Enhanced methylation resulting in improved central neurotransmitter production
12. Central to the effect of nicotine on depression is the stimulation of;
- a) DHEA
 - b) GABA
 - c) Dopamine
 - d) Cortisol
 - e) Progesterone

13. The DMPS challenge test is utilized to detect the following:
- a) Presence of heavy metals
 - b) Assessment of HPA axis with steroid challenge
 - c) Iodine status under challenge
 - d) Presence of fat soluble intoxicants
14. What is the most efficient and easiest way to evaluate melatonin levels?
- a) Radio-immune assay using plasma
 - b) Pineal biopsy
 - c) Salivary testing, morning, evening and midnight
 - d) Urinary indol3 Carbinol
 - e) Slit lamp optimalogical testing
15. An aberration in the Methylene Tetrahydra Folate Reductase gene could be evidenced by an elevation in _____.
- a) Cyanocobelamin
 - b) Glutathione
 - c) Magnesium
 - d) Homocysteine
 - e) Methylcobalamin

ANSWER KEY:

- 1. a)
- 2. b)
- 3. d)
- 4. d)
- 5. c)
- 6. a)
- 7. d)
- 8. b)
- 9. a)
- 10. d)
- 11. d)
- 12. d)
- 13. a)
- 14. c)
- 15. d)

**CERTIFIED CLINICAL NUTRITIONIST (CCN)
EXAMINATION REFERENCE TEXT**

Alcamo and Krumhardt. **Barrons Anatomy & Physiology the Easy Way**, 2nd Edition. Publisher: Barrons Educational Series / 2004 ISBN # 0-7641-1979-6

Chernin. **The Complete Homeopathic Resource for Common Illness**. Publisher: N. Atlantic Books ISBN# 1-5564-3-608-4

Crellin & Ania. **Professionalism and Ethics in Complementary and Alternative Medicine**. Publisher: Haworth Integrative Healing Press / 2002 ISBN: 0-7890-1226-X

Integrative Medicine. **Quick Access: Professional Guide to Conditions, Herbs and Supplements**. Publisher: Integrative Medicine ISBN# 0-9670-7725-7

Mims, Dockrell, Goering, Riott, Wakelin and Zuckerman. **Medical Microbiology**, 3rd Edition. Publisher: Mosby Elsevier / 2004 ISBN# 0-3230-3575-2

Pizzorno and Murray. **Textbook of Natural Medicine**, 3rd Edition, 2 Volume Set. Publisher: Churchill Livingstone Elsevier / 2006 ISBN# 0-443-07300-7

Rakel. **Integrative Medicine**, 2nd Edition. Publisher: Saunders Elsevier / 2007 ISBN# 1-4160-2954-0

Sauberlich. **Laboratory Tests for the Assessment of Nutritional Status**. Publisher: CRC Press / 1999 ISBN# 0-8493-8506-7

Shils, Shike, Ross, Cabellero and Cousins. **Modern Nutrition in Health & Disease** 10th Edition. Publisher: Lippincott, Williams and Wilkins / 2006 ISBN# 0-7817-4133-5

Wald. **The Anti-aging Encyclopedia of Tests and Natural Treatment**. Publisher: Blood Logic Inc. / 2007 ISBN 0-9671597-0-10 (available at www.blooddetective.com)

Wilson. **Adrenal Fatigue: The 21st Century Stress Syndrome**. Publisher: Smart Publications / 2001

CNCB, **Professional Practice Guidelines & Disciplinary Procedures**. Download on PGSCN online program page.

CERTIFIED CLINICAL NUTRITIONIST (CCN)

CODE OF PROFESSIONAL ETHICS AND RESPONSIBILITY

- 1) A Certified Clinical Nutritionist must both individually and collectively, maintain a high level of professional and ethical conduct and relationship with clients, colleagues, members of allied health professionals, and the public.
- 2) As clinical nutrition is a specialization in the science of nutrition, the Certified Clinical Nutritionist must be competent to work in the health care system with other professionals to make available expertise in the field of clinical nutrition.
- 3) A Certified Clinical Nutritionist must have an understanding of nutrition biochemistry that enables him/her to competently assess and evaluate signs of nutritional deficiency or imbalance, through the use or disuse of specific foods, vitamin, mineral, amino acid, or other food substances as necessary to maintain health.
- 4) A Certified Clinical Nutritionist must be trained to interpret and utilize certain non-invasive laboratory and non-laboratory tests and other evaluation techniques designed to assist in nutritional assessment.
- 5) A Certified Clinical Nutritionist, unless licensed pursuant to the Medical Practices Act of any state in the United States, shall not practice medicine, which means the diagnosis, treatment, operations or prescription for any disease, pain, injury, deformity, or other physical or mental condition.
- 6) A Certified Clinical Nutritionist will not hesitate to seek consultation with other professionals whenever advisable or requested by the client. If at any time the member believes that a client will be better served by a medical practitioner or another method of practice, the client will be referred immediately.
- 7) All information concerning clients shall be kept in strictest confidence, and shall be divulged only when required by law or when authorized by the client.
- 8) Honesty and integrity shall characterize all conduct with clients as clinical nutrition is a profession deserving of respect, honor, and dignity. Misleading, deceptive, irresponsible or fraudulent statements or advertising or otherwise are deemed unethical and shall not be condoned in any form.
- 9) Every profession has the responsibility to regulate itself, to determine and judge its own members. Such regulation is achieved largely through the requirements of certification boards and through the influence of professional societies. Every practicing professional has the dual obligation of following the directives of the certification board (Clinical Nutrition Certification Board), as well as becoming a part of a professional society and of observing its

rules and ethics.

- 10) A Certified Clinical Nutritionist shall abide by all laws and regulations pertaining or relating to the practice of clinical nutrition.
- 11) A Certified Clinical Nutritionist shall not knowingly solicit the client to another nutritionist.
- 12) In any dispute between or among a Certified Clinical Nutritionists, involving ethical or professional matters that relate to the certification status of either party, the matter in controversy will be referred to the CNCB Judicial Committee.
- 13) A Certified Clinical Nutritionist may accept or reject a particular client, bearing in mind that whenever possible, a response should be made to any reasonable request for his/her services. Once a client has accepted, a duty is owed not to neglect, abandon or withdraw from the relationship. A provider may withdraw from the relationship only if he/she feels 1) that the client's needs exceed his/her skills and/or abilities, 2) a request is made to act illegally, immorally or unethically in the performance of professional services, 3) and irreconcilable or unhealthful conflict in personality exists between the client and a provider.
- 14) Any fee charged by a practicing Certified Clinical Nutritionist shall be reasonable and customary, or shall be agreed upon in advance by both client and the provider. Fees shall compensate for services actually rendered and the division of professional fees shall be deemed appropriate.
- 15) A Certified Clinical Nutritionist will seek to achieve the highest level of professional competence by attendance at CNCB appropriately designated and professional seminars, reading professional and scientific literature, and by all other reasonable means to avail him/herself of the latest scientific knowledge, skills and procedures of the profession and shall exercise tolerance toward those ideas and professionals who represent divergent clinical perspectives.
- 16) Illegal, unethical or incompetent conduct shall be in violation of the Code which is just cause for proceedings by the Judicial Committee (see CCN Professional Practice Guidelines & Disciplinary Procedures)
- 17) The enumerations of obligations in this CCN Code of Professional Ethics and Responsibility are not exhaustive and do not constitute a denial of the existence of other obligations, equally imperative, though not specifically mentioned herein.