TABLE OF CONTENTS

	TOPIC	PAGE
I.	Nutrition Related Sections Of Family Planning Initial History	2-4
II.	General Nutrition/Diet Screening	4 - 5
III.	Nutrition Considerations Of Various Contraceptives	5
IV.	Weight Assessment	6 - 7
V.	Overweight/Weight Loss	8 - 10
VI.	Underweight/Eating Disorders	10 - 11
VII.	Folate/Folic Acid	11 - 13
VIII.	Anemia	13 - 14
IX.	Calcium	14 - 16
X.	Diabetes	16 - 17
XI.	Cholesterol And Triglycerides	18 - 20
XII.	Additional Nutrition Resources	21

I. Nutrition Related Sections Of Family Planning Initial History Form

A. Your Medical History

1. Heart disease or high blood pressure:
   a. Reduce sodium intake (do not add salt to foods or when cooking; reduce intake of salty foods); increase calcium and potassium in the diet by having 3 or more servings of low-fat dairy foods and 8-10 servings of fruits and vegetables each day.
2. Migraine or frequent headaches:
   a. Reduce or eliminate foods that cause migraines in sensitive individuals such as: tuna, mackerel, mahi-mahi, aged cheese (cheddar), red wine, chocolate, beer, hot dogs, bacon, ham, salami, some nuts and foods made with monosodium glutamate (MSG).
   b. Avoid skipping meals as fasting can increase the likelihood of a headache.
3. High cholesterol / triglycerides:
   a. Reduce total dietary fat, saturated fat and cholesterol in diet. Encourage label reading.
   b. Limit egg consumption to 3-4 yolks per week.
   c. Encourage fish intake to increase omega-3 fatty acids.
   d. Increase fiber, especially soluble fibers found in oatmeal, apples and beans.
   e. Increase physical activity.
   f. Refer to nutrition protocols for high cholesterol for more detailed recommendations.
4. Blood problems (Sickle cell anemia, hemophilia, low iron):
   a. Iron deficiency anemia-encourage adequate intake of lean red meats, pork and lamb; include vitamin C rich foods (citrus foods) with iron rich foods or iron supplements to increase absorption; avoid having dairy products or calcium supplements at the time of taking an iron supplement.
   b. Refer to nutrition protocols for iron deficiency anemia for more detailed recommendations.
5. Gall bladder disease:
   a. Oral contraceptives and estrogen may increase risk of gallbladder disease after years of use.
   b. Lose excess weight if needed. Avoid rapid weight loss.
   c. Chronic gallbladder disease-may need to limit total dietary fat.
   d. Limit gas-producing foods such as cabbage, cauliflower, broccoli, beans, onions etc.
6. Diabetes:
   a. Balance carbohydrate intake throughout the day.
   b. Carbohydrate containing foods: foods with added sugars, fruits, bread and grain products, dairy products, and starchy vegetables like beans, corn and potatoes.

B. Personal Nutritional Information

Food	Recommended servings	Serving Sizes	Comments:
Milk, cheese, other dairy products	3-4 1300 mg calcium teens 1000 mg calcium adults	Average servings include 8 oz. Milk or calcium fortified juice, 8 oz. Yogurt, 1 ½-2 oz. Cheese	Provides calcium, which is needed in higher amounts for those taking Depo-Provera.
Chips, cakes, pies:	Limit		Limit these especially those taking OC or Depo due to weight gain. Diabetics need to regulate carbohydrate intake as well for optimal glucose control.
Meat, fish, poultry, eggs, and beans	2-3	3-ounce servings per day	Provide protein and minerals like iron
Fruits and vegetables	At least 5 serving of fruits and or vegetables per day	4 oz. juice, 1 med. piece fresh fruit, ½ cup canned or frozen, and ¼ cup dried fruit.	Provide fiber for satiety and fullness, which may be helpful with weight regulation. Provide vitamins and folate in citrus and dark green vegetables.
Breads, cereals, and grains:	6-11	1 slice bread, ½ cup cooked cereal or pasta, ¾ c ready to eat cereal	Fortified cereals are an excellent source of folic acid and iron. Whole grain products (whole wheat bread, oatmeal etc.) may help with weight regulation
Caffeine	In moderation	6 oz. coffee, tea; 12 oz. soft drink	Flavored teas and specialty coffees are higher in calories than brewed tea or coffee and may result in weight gain; avoid or limit caffeine intake to 2-3 servings during pregnancy

1. How often do you skip meals?
   Refer to section on weight management for safe and effective strategies for weight loss.

2. Is your weight: just about right, too heavy, too thin?
   Helpful in determining healthful body image. Refer to appropriate nutrition sections on weight management.

3. Have you ever vomited or used laxatives to lose weight?
   References to possible eating disorder. Refer to weight sections.

4. Are you on a special diet?
   Refer to sections on diabetes and cholesterol.

5. Are you taking: vitamins, iron, folic acid, calcium or other weight loss or herbal preparations?
   Refer to appropriate sections in nutrition section.

II. General Nutrition / Diet Screening Methods

A. Background

Diet screening is used to determine whether a woman's intake of nutrients is adequate and to highlight areas where dietary change may be needed. Knowledge about current eating patterns is necessary to influence behavior change. Information can be gathered about foods commonly consumed, eating patterns, cultural practices, and use of dietary supplements. The type of diet screening typically done is the 24-hour recall.

B. The Food Guide Pyramid

A range of servings is given for each major food group and the number of servings needed for an individual will vary depending on age, sex, size, and activity level. The Pyramid divides foods into six different groups:

- Breads, cereals, rice, and pasta
- Vegetables
- Fruits
- Milk, yogurt, and cheese
- Meat, poultry, fish, dry beans, eggs, and nuts
- Fats, oils, and sweets

Foods are grouped together because they are good sources of similar nutrients. Serving sizes are adjusted so that a serving of any food within a group supplies similar amounts of nutrients. Thus, foods within a group may be "exchanged" for one another and the average quality of the diet will remain adequate. Special attention should be paid to cultural considerations. Copyright free nutrition education materials in 37 languages are available free of charge through the following website, http://monarch.gsu.edu/multiculturalhealth/ The updated food pyramid information is available at www.MyPyramid.gov . The resources are not available in Spanish at the time of the review of this protocol.

C. Daily Food Guide Screening Tool / 24 Hour Food Recall

The screening tool is used to tally a client's 24-hour recall or food frequency questionnaire. It is a way to screen for or detect those individuals who may have an inadequate diet. A true diet assessment requires more detailed information, such as a food intake record kept for several days and often includes biochemical testing.

The 24 Hour Recall requires the individual to write down or tell the interviewer everything that has been consumed in a 24-hour period. A few simple questions will usually help the individual remember what was eaten, when, and in what quantity. The main disadvantage of this tool is that information is dependant upon memory and it is difficult for many people to accurately estimate portion sizes. Use of food models, glasses and bowls of a known measurement can help achieve greater accuracy regarding food portion size. Individual diets vary day to day and this should be taken into account when analyzing the diet. It is important to assess if the intake on the day reported reflects a typical day or if the intake was unusual because of a special occasion, illness, or another infrequent event.

Evaluation is done by comparing the number of servings eaten in each food group to the recommended number of servings for each group. Areas needing improvement should be prioritized and counseling should focus on how to improve the woman's diet.

D. Additional Counseling Considerations

Dietary recommendations need to be modified according to an individual's dietary practices. A person's income level, cultural background, religious beliefs about food, climate, geographic

location, agricultural conditions, and philosophical attitudes toward food can all influence his or her eating habits. The low-income participant needs special attention since a nutritionally adequate diet cannot be obtained when there is not enough money to purchase the necessary food. It is important to find out the participant's favorite foods and determine how to incorporate these foods into a balanced diet.

Low-income participants should be referred to food assistance programs such as WIC and/or Food Stamps, and appropriate community agencies, i.e., food banks.

E. Counseling Points:

1. Eat a variety of foods every day and at least 5 servings of fruits and/or vegetables each day.
2. Drink at least 8 glasses of water each day.
3. Avoid having too many beverages with caffeine or alcohol.
4. Lose weight if you need to. Cut down on portion size to save calories.
5. Do not skip meals. You may eat too much at the next meal or later in the day if you do.
6. Use less added fat, sugar, and salt.
7. Choose low fat dairy products and lean meats.
8. Eat high fiber foods like vegetables, fruits, whole grains and beans more often.

III. Nutrition Considerations With Various Contraceptives

Refer to patient information sheets for more detailed information.

A. Oral Contraceptives

1. Oral contraceptives have been shown to cause a decrease in glucose tolerance in some users. However, in the non-diabetic woman, oral contraceptives appear to have no effect on fasting blood glucose. Because of these demonstrated effects, prediabetic and diabetic women should be carefully monitored while taking oral contraceptives.
2. A small proportion of women will have persistent hypertriglyceridemia while on the pill. Some progestens may increase LDL (“bad cholesterol”) levels.
3. Oral contraceptives may cause some degree of fluid retention.
4. Women taking oral contraceptives should eat a well-balanced variety of foods that are good sources of vitamins and minerals.

B. Paraguard/IUD®

1. May be at risk of anemia. Encourage adequate iron intake, refer to iron deficiency anemia guidelines.

C. Depo-Provera®

1. Decreased bone mineral storage, increased mineral loss. Studies show this loss to be reversible after discontinuation of method. Women who wish to remain on this method beyond two years must be counseled about the potential risks and about other available methods of birth control. This counseling must be documented in the woman’s chart.
2. Supplementation of 500 mg of calcium may help to counteract this.
3. Weight gain: average gain of 4 pounds per year. Weight gain continues annually with continued use; refer to section on weight management.

IV. Weight Assessment

A. Assessment Methods

1. Body Mass Index (BMI): Body mass index describes relative weight for height and is significantly correlated with total body fat content but cannot be interpreted as a certain body fat percentage. The BMI should be used to assess overweight and obesity and to monitor changes in body weight. Individuals with a high BMI are at greater risk for cardiovascular disease, diabetes, high blood pressure and certain cancers.

B. BMI can be calculated in either English or metric units or by using a conversion table.

1. English

BMI = [weight in pounds ÷ height in inches ÷ height in inches] x 703

Example: A person weighing 210 pounds and 6 feet tall would have a BMI = 210 pounds ÷ by 72 inches ÷ by 72 inches multiplied by 703 = 28.5

2. Metric

BMI = weight in kilograms ÷ [height in meters]^2

Example: A person weighing 95.3 kilograms and 182.9 centimeters tall would have a BMI = 95.3 kg ÷ by [182.9 cm x .01 to convert to meters]^2 = 28.5

C. Classification of weight status for non-pregnant adults

(Source: NHLBI Clinical Guidelines on the Identification, Evaluation and Treatment of Overweight and Obesity in Adults-The Evidence Report, 1998)

Weight status	BMI value
Underweight	< 18.5
Normal	18.5 – 24.9
Overweight	25.0 – 29.9
Obese	30.0 – 39.9
Extreme Obesity	≥ 40

D. Classification of weight status for pregnant women

(Source: IOM. 1990-Nutrition During Pregnancy)

Weight status	Pre-pregnancy BMI value
Underweight	< 19.8
Normal	19.8 – 26.0
Overweight	26.1 – 29.0
Obese	>29.0

E. Classification of weight for adolescents < 20 years of age

1. Use of the 2000 CDC revised sex specific growth grids with BMI is recommended for this population as body composition is still developing. Calculation of BMI value is the same as for adults however the weight status associated with the BMI value differs and is correlated to growth percentiles.

Weight Status	Growth Percentile
Underweight	< 5th percentile
At risk of overweight	85th-95th percentile
Overweight	≥ 95th percentile

F. Additional Resources

BMI table from the NHLBI Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults-The Evidence Report, 1998.

2000 CDC Growth Charts: United States Body mass index-for-age percentiles: Boys, 2 to 20 years Body mass index-for-age percentiles: Girls, 2 to 20 years at www.cdc.gov/nccdphp/dnpa/bmi/

V. Overweight / Weight Loss

A. Definition

Overweight is defined as having a body mass index (BMI) greater than or equal to 25. Obesity is defined as having a BMI greater than or equal to 30. Intervention when BMI is between 25-30 is an optimal time to promote lifestyle changes in an attempt to avert negative health consequences associated with higher BMI values.

B. Advantages to Weight loss:

1. *Lower elevated blood pressure* in overweight and obese individuals with high blood pressure
2. *Lower total cholesterol, low-density lipoproteins and triglycerides* while raising high-density lipoproteins in individuals with dyslipidemia
3. *Lower elevated glucose* levels in overweight and obese individuals with type 2 diabetes
4. Improved health can be achieved with even small weight changes such as a reduction of 10% of weight or 2-4 points lower BMI value.

C. Weight Loss Goals:

1. Initial goal of 10% reduction (2-4 BMI points) of weight from baseline
2. Weight loss of 1 to 2 lb/week for 6 months, is a realistic and attainable goal for most adults
3. Decreased waist circumference

D. Weight Loss Strategies:

1. Diet Therapy

a. Excessive calories, regardless of diet composition (carbohydrate, protein, fat) promote weight gain. Total caloric intake, not diet composition, effects weight.
b. A low calorie diet (LCD) that promotes a caloric deficit of 500 to 1,000 kcal/day over usual intake should be the basis of those wanting to lose 1 to 2 lb/week.
c. Reducing dietary fat without reducing overall calories is not sufficient for weight loss. Reducing dietary fat, which is a concentrated source of calories, in addition to reducing dietary carbohydrates, can facilitate calorie reduction. Reduced fat products may not be lower in calories than the full fat versions, check the label.
d. Increase fiber: fiber promotes satiety. Increase fruit and vegetable consumption to at least 5 servings each day. Advocate having fruit or vegetables for snacks and dessert. Start the day with a high fiber cereal and select whole grains like whole wheat bread or brown rice, more often.
e. Limit sweets and other empty calories. Cookies, ice cream and regular soft drinks are high in calories yet low in nutrients.

(1) **Fad diets:** Fad diets typically promote quick weight loss yet fall short on long-term weight loss success. The following is a short overview of some common fad diets adapted from the American Dietetic Association.

(a) **Food-specific diets**: Some diets tout one food with special properties that can cause weight loss. Eating just one food while excluding others can result in weight loss because eating the same food becomes boring and you end up not eating the food or enough to maintain your weight. These diets don't teach healthy eating habits and are usually not nutritionally balanced.

(b) **High-protein, low-carbohydrate diets**: These diets are based on the idea that carbohydrate is bad and that many people are insulin-resistant which causes them to gain weight when they eat it. Authors of these diets are quick to point out that people eating more carbohydrates--which nutrition professionals recommend--are heavier than before. What they don't tell you is that people are eating **more** calories, which is the **real** reason they are gaining weight.

(c) **High-fiber, low-calorie diets**: Fiber-rich foods are an important part of a healthy eating plan and they can be very helpful for people trying to lose weight. Fiber-rich foods are filling and because fiber cannot be digested, it doesn't have calories. Although too much is not always better. Eating more than 50 or 60 grams a day can cause cramping, bloating and diarrhea. Eating lots of fiber does not guarantee weight loss. The only thing that will cause weight loss is eating fewer calories.

(d) **Liquid diets**: There are over-the-counter liquid meal replacements and very low calories diets that require medical prescription and supervision. These should not be used for long-term weight loss and they actually plateau after three months. Both regimens serve a short-term purpose, however, they don't teach good life-long habits.

(e) **Fasting**: Fasting has been recommended for years to cleanse the body or to start a weight-loss program. Actually, fasting just deprives your body of nutrients. You end up with low energy, weakness and lightheadedness--not weight loss. And when carbohydrates are not available for energy, ketones can

build up and stress the kidneys, which can be harmful to your health.

2. Physical Activity
   a. Physical activity is recommended as part of the weight loss strategy and weight management program because it will contribute to weight loss, may decrease abdominal fat, increase cardiovascular fitness, and may help with weight maintenance once weight loss goals achieved.
   b. Physical activity recommendations for weight loss should consist of moderate physical activity for 30-45 minutes, 3 to 5 days per week. Long-term goal is to incorporate 30 minutes or more of moderate physical activity on most days of the week.

3. Behavior Therapy
   a. Practitioners need to assess the patient's motivation to begin weight loss therapy; assess her/his readiness to change and implement the plan and take appropriate steps to motivate the patient for treatment.

4. Pharmacotherapy
   a. FDA approved weight loss drugs may be part of a comprehensive weight loss program including diet and physical activity for patients with a BMI $\geq$ 30 with no other risk factors, or those with a BMI of $\geq$27 with concomitant obesity-related risk factors or disease. Drug therapy should never be used without lifestyle modification.

5. Weight Loss Surgery
   a. Weight loss surgery is only an option in carefully selected patients with clinically severe obesity classified as a BMI $\geq$ 40 or $\geq$35 with comorbid conditions. Weight loss surgery should only be an option after less invasive methods have failed and patient is at high risk for obesity-associated morbidity or mortality.

E. Counseling Points:

1. Eat a variety of foods every day
2. Limit the fat in your diet: avoid fried foods, whole milk, extra sauces and gravies, remove visible fat and skin from meats and poultry, bake, broil or grill meats.
3. Avoid too many sweets: these foods are high in calories but low in nutrients.
4. Don't drink your calories. While juice provides nutrients missing in soft drinks, it is calorically dense. A serving size of juice is only 4 ounces. Eliminating two regular soft drinks daily will result in a half pound of weight loss per week!
5. Increase fruit and vegetable consumption to at least 5 servings per day. Take veggies for a snack or try a fruit salad for dessert.
6. Increase fiber in the diet. Fiber creates a feeling of fullness in addition to other health benefits. Fiber is found in fruits, vegetables and whole grains like oatmeal, whole wheat bread and brown rice.

F. Nutrition Care Plan

Document assessment, education, client's behavior change goal, referral, and follow up if needed.

G. Referral

Refer to a reputable community weight loss program or dietitian for follow up care. When investigating weight loss programs or products, beware of programs requiring purchase of special foods or pills, fraudulent claims and high costs. Some hospitals offer weight management programs.

VI. Underweight

A. Definition

Underweight is defined as having a body mass index (BMI) less than 18.5. For pregnant women, the Institute of Medicine considers a woman to be underweight with a BMI value less than 19.8 and advocates higher weight gain in pregnancy.

B. Background

Being underweight is not an absolute indicator of health status. It is possible to be healthy and have a lower than normal BMI value. It is also possible that the individual may have an eating disorder, poor knowledge of sound eating practices, or an undiagnosed illness.

Women with low BMIs may be amenorrheic or have fertility problems. Weight gain may assist with regulation of menstrual cycle and fertility. Underweight women are at greater risk for delivering a low birth weight baby.

1. Eating Disorders

Both eating disorders can have serious health effects and can be life threatening.

a. Anorexia Nervosa: characterized by a refusal to maintain a normal weight; intense fear of fatness even when underweight; absence of menstrual periods; defensiveness or withdrawal when asked about diet and weight.

b. Bulimia Nervosa: persistent over concern with weight and appearance; repeated episodes of binge eating followed by purging with vomiting, laxatives, or extreme exercise; food restriction when not bingeing; feelings of loss of control while bingeing; in some cases other impulse control problems are present such as shop lifting, abuse of alcohol or drugs, and casual sex.

C. Counseling Points

1. Discuss weight concerns with client and determine if body image is distorted.
2. Discuss how weight status can effect pregnancy planning.
3. Review dietary intake for adequacy.
4. Evaluate other lifestyle factors contributing to underweight status such as smoking, excessive exercise, lack of food resources.
5. Discuss calorically dense foods and beverages to increase calories and weight gain.

D. Nutrition Care Plan

Document assessment, education, client's behavior change goal, referral, and follow up if needed.

E. Referral

1. If an eating disorder is suspected, refer client to primary care giver and a mental health provider.
2. Refer to food resources when appropriate such as food stamps, commodities or Women, Infants and Children (WIC) program.
3. Additional information on eating disorders can be obtained through the Anorexia Nervosa and Related Eating Disorders, Inc. at www.anred.com

VII. Folate / Folic Acid

A. Background

Folate is the water-soluble B vitamin naturally occurring in foods. Water-soluble vitamins are not stored in the body for long periods of time and need to be taken daily. Folic acid is the oxidized form found in vitamins and fortified foods. Folic acid from supplements is more readily absorbed than from natural sources. Folic acid is valuable for a variety of health aspects and may assist in the prevention of neural tube defects, heart disease, and cervical cancer.

B. Requirements

All women of childbearing age capable of becoming pregnant should consume 0.4 mg of folic acid per day to reduce the risk of fetal spina bifida or other neural tube defects (NTDs) and increase intake to 600 micrograms (0.6 mg) upon becoming pregnant. This recommendation was developed based on findings from studies conducted over the last eleven years, i.e., folic acid, when consumed in adequate amounts beginning several weeks before conception and continuing during the early weeks of pregnancy, will reduce the risk of having a child with a NTD. Women should be informed of this recommendation when being seen for:

1. Initial or annual visit in family planning clinics.
2. Postpartum visit in prenatal or family planning programs.
3. Postpartum or breastfeeding women seen in any program.
   Preconception counseling
4. All women should receive counseling about foods rich in folic acid and how to incorporate them into their diet.

C. History of NTD

Women with a history of pregnancy affected by a neural tube defect or spina bifida, or those who have spina bifida themselves and are planning on becoming pregnant, need to see their doctor for a prescription for 4000 micrograms (4.0 mg). This may be helpful in reducing the chance of a neural tube defect in future pregnancies. The folic acid dose should be obtained from pills containing only folic acid. Multivitamin (over-the-counter and prescription) preparations containing folic acid should not be used to attain the 4-mg. dose because harmful levels of vitamins A and D could also be taken.

Prescribing physicians should be aware of the potential for high doses of folic acid to complicate the diagnosis of vitamin B^{12} deficiency.

D. Food Sources of Folate

Meat and Meat Alternate Group	Folate (mcg)
Lentils (2 cup)	179
Black-Eyed Peas (2 cup)	178
Kidney Beans (2 cup)	115
Lima Beans (2 cups)	75
Peanuts (1 oz.)	41

Bread and Cereal Group	Folate (mcg)
Ready to Eat Fortified Cereal (3/4 cup)	400
Ready to Eat Cereal (3/4 cup)	100
Whole Wheat Bread (1 slice)	14

Fruit and Vegetable Group	Folate (mcg)
Spinach (2 cup)	131
Brussel Sprouts (2 cup)	79
Broccoli (2 cup)	54
Orange juice (4 oz.)	54
Peas (2 cup)	51
Orange (1 medium)	47
Corn (2 cup)	38
Okra (2 cup)	37
Banana (1 medium)	22

E. Counseling Points:

1. Eat a diet rich in folic acid: enriched cereals, orange juice, spinach, beans, black-eyed peas, garbanzo beans, lentils, and asparagus.
2. Take a multivitamin daily. Most multivitamins contain all of the necessary folic acid (0.4 mg or 4 mcg). Take at the same time as brushing teeth, eating breakfast or other established habit to ensure this becomes part of the daily routine.

F. Nutrition Care Plan

Document assessment, education, client's behavior change goal, referral, and follow up if needed.

VIII. Anemia

A. Background

Although anemia is most frequently associated with iron deficiency, it may also be caused by other nutritional deficiencies (e.g., folate, vitamin B-12), infection, chronic disease, protein-calorie malnutrition, hemoglobinopathies, or blood loss. Iron and folate deficiency are the most common causes of anemia during the reproductive period. The mean corpuscular volume (MCV) can help distinguish between iron and folate deficiency. A low MCV suggests iron deficiency whereas folate deficiency anemia is characterized by macrocytic red blood cells and a higher MCV. Another possible but less likely cause of macrocytic red blood cells is vitamin B-12 deficiency. A serum vitamin B-12 level should be determined for women who do not eat meat, fish, poultry, eggs, or milk products. Iron is needed to form hemoglobin, which assists in carrying oxygen to the body cells and carbon dioxide back to the lungs. Iron deficiency ranges from iron depletion with no physiological impairments to iron deficiency anemia, the final and most severe stage of iron deficiency. If an iron deficiency exists, then sufficient amounts of hemoglobin are not formed and the final result is that less oxygen is carried to all parts of the body causing iron-deficiency anemia. It is characterized by the production of smaller, light-colored red blood cells. A woman who is anemic will look pale; she will be tired, listless, and irritable. She may also report that her appetite has dropped and that she is having headaches and dizziness. Iron deficiency anemia in the first and second trimesters of pregnancy has been associated with an increased risk of prematurity and low birth weight.

B. Assessment of iron deficiency anemia

Hematocrit values for anemia for women ≥ 12 years of age[1]

Altitude (Feet)	Hematocrit (%)	Cigarette smoking <1 PPD	Cigarette smoking > 1 PPD Hematocrit (%)
3,000-4,999	<37%	<38%	<39%
5,000-6,999	<38%	<39%	<40%
7,000-7,999	<39%	<40%	<41%
8,000-8,999	<40%	<41%	<42%
9,000-9,999	<41%	<42%	<43%
>10,000	<42%	<43%	<44%

[1] Centers for Disease Control and Prevention. Recommendations to prevent and control iron deficiency in the United States. MMWR 1998;47:1-29.

C. Iron recommendations

The Daily Reference Intake (DRI) for women 19-50 years of age (or until menopause) is 18 mg/day (males: 8 mg/day) and increases to 27 mg/day in pregnancy.

D. Food Sources

There are two forms of iron, heme and non-heme. Meats have a greater percentage of heme iron than non-heme, which is found in plant foods. Vitamin C has been shown to improve iron absorption. Tannins and polyphenols, found in tea, coffee and red wine; and phytates, found in wheat bran and soy, can negatively affect iron absorption.

1. Iron-rich Foods
   Liver, beef, pork, lamb, turkey, chicken, fish
   Iron-fortified cereals, whole grain cereals and breads
   Cooked beans and lentils, cooked greens, dried apricots, raisins

2. Vitamin C rich foods
   Citrus fruits and juices, tomatoes, strawberries, melons, dark green leafy vegetables, potatoes

E. Counseling Points
1. Review good sources of iron in the diet and those containing vitamin C to increase absorption.
2. Limit consumption of coffee, tea, wheat bran and soy products.
3. To avoid side effects from supplements, take them with meals.

F. Nutrition Care Plan
Document assessment, education, client's behavior change goal, referral and follow up if needed.

G. Referral
Refer to a care provider who can provide supplementation. The treatment of iron deficiency anemia requires iron supplementation and dietary counseling to prevent recurrence.

IX. Calcium

A. Background

Calcium is a mineral needed for healthy development of teeth, bones, transmission of nerve impulses, blood clotting, and prevention of hypertension. Low calcium intake can contribute to osteoporosis. Estrogen loss due to menopause or ovarian removal contributes to accelerated bone loss and osteoporosis. Calcium supplements such as calcium carbonate or calcium citrate can be used if dairy products are not tolerated or if unable to consume recommended amount of calcium through the diet alone. Adequate amounts of vitamin D are needed to promote calcium absorption. Vitamin D is found in fortified milk, egg yolk, tuna and salmon. The body also produces Vitamin D after exposure to sunlight. Only short periods of time each day are needed. Supplementation of vitamin D alone is not recommended.

B. Risk Factors / Assessment

1. Family history of osteoporosis
2. Low calcium intake
3. High alcohol use
4. Smoking
5. Underweight or short stature
6. Review dietary intake and use of calcium supplements. Evaluate client's alcohol consumption and/or cigarette use.

C. Calcium Needs

AGE GROUP	REQUIRED AMOUNTS	NUMBER OF SERVINGS*
Adolescents ages 9-18	1300 mg	4-5
Adults 19-50	1000 mg	3-4
Pregnant or lactating	1000 mg	3-4
Adults ages 51 and up	1200 mg	4
Menopausal taking estrogen	1000 mg	3-4
Menopausal not taking estrogen	1500 mg	5

** Examples of one serving: 1 cup milk, yogurt, or calcium fortified juice; 1 ½ oz. Natural cheese, 2 oz. Processed cheese*

D. Calcium content of various foods in milligrams (mg)

1 cup calcium fortified juice = 400
1 cup plain nonfat yogurt = 452
1 cup low-fat fruit yogurt = 330
3 oz sardines, canned, with bones = 372
3 oz salmon with bones = 187
½ cup almonds = 166
1/2 cup Brazil nuts = 130
1 cup tofu =130
1 cup refried beans 140
1 cup turnip greens = 249
1 cup collard greens = 358
1 cup broccoli = 94

E. Counseling Points

1. Aim for the appropriate number of calcium servings per day.
2. Limit caffeine and alcohol consumption.
3. Avoid excessive protein intake, which can cause increased calcium excretion promoting bone loss.
4. Weight bearing exercise such as walking, jogging, aerobics or weight lifting can help with calcium absorption within the bones.
5. Use calcium supplements, with added vitamin D, if needed to meet required daily amounts.
6. Discuss the importance of all of the above for women using Depo Provera. Reassess risks vs. benefits of remaining on Depo Provera after two years of continuous use.

F. Special Considerations: Lactose Intolerance

More than two-thirds of non-white and up to 20 percent of white American adults have trouble digesting lactose, the carbohydrate naturally found in milk. Lactose intolerance is characterized by symptoms of gas, cramps, bloating, or diarrhea when products containing lactose are consumed. Individuals will display varying degrees of lactose intolerance and many can consume up to a cup of milk at a time without experiencing symptoms. Lactose tolerance tends to improve during pregnancy. Cooking with dairy products often helps with digestions (cooked pudding, cream soups etc.).

Over the counter products such as Lactaid® tablets or dairy products can also be helpful. Soy beverages may be fortified with calcium, check the label.

1. Try small servings, i.e., 4 ounces of milk several times a day. Whole milk may be better tolerated than low fat or skim milk, and taking milk with other foods often helps avoid symptoms.
2. Try yogurt containing active, live cultures. To save money buy plain yogurt in large containers and add fruit or other flavorings to taste.
3. Try aged hard cheese such as cheddar cheese, although cheese contains less lactose than milk.
4. Use milk in cooking soups, puddings, or casseroles.

G. Nutrition Care Plan

Document assessment, education, client's behavior change goal, referral and follow up if needed.

H. Referral

If client has a positive family history of osteoporosis, or if she is concerned about risk factors, refer to her private physician.

X. Diabetes

A. Background

Diabetes is a disease in which the body does not produce or properly use insulin. Insulin is a hormone that is needed to convert sugar, starches and other food into needed energy. Genetics and environmental factors such as obesity and lack of exercise may predispose an individual to diabetes. There are three types of diabetes:

1. **Type 1** - the body does not produce any insulin; occurs most often in children and young adults; need to take daily insulin injections: accounts for 5 to 10 percent of diabetes.
2. **Type 2** - the body either does not make enough insulin or does not use it properly; the most common form of diabetes; accounts for 90 to 95 percent of diabetes; nearing epidemic proportions due to an increased number of older Americans, and a greater prevalence of obesity and sedentary lifestyles.
3. **Gestational Diabetes (GDM)**– any degree of glucose intolerance with onset or first recognition during pregnancy; occurs in up to 7 percent of all pregnancies; obesity, past pregnancy with GDM, and certain ethnic groups with high rates of carbohydrate intolerance (Hispanic, African American and Native American) are at increased risk for developing GDM; resolves with delivery however risk of developing Type 2 diabetes significantly increased. Women with Type 1 or 2 in poor control at the beginning of the pregnancy are at greater risk for congenital malformations and other pregnancy related complications.
4. **The following are resources for more information on diabetes:**

   http://www.diabetes.org/home.jsp

   http://care.diabetesjournals.org/content/vol30/suppl_1/

B. Diabetes and Nutrition

1. All foods contain carbohydrate, protein, fat or a combination of these. Carbohydrates are found in fruits; breads, pastas, cereals and other grain products; dairy products; vegetables and foods with added sugar like desserts or soft drinks. Carbohydrates are the bodies preferred source of energy and are converted to glucose with digestion. Balancing carbohydrate intake throughout the day will help regulate glucose values

throughout the day preventing wide variations in blood glucose values. The old misconception that people with diabetes cannot have sweets no longer holds true.

2. The type of carbohydrate, whether from fruit or candy, does not affect rate of absorption or peak of blood glucose value but rather the amount of carbohydrate effects blood glucose values. Therefore, those with diabetes can enjoy small servings of sweets when adjusting their meals for additional sources of carbohydrate.

3. Modest weight loss of even 10-20 pounds can improve blood glucose control.

4. Nutrition and diet education are essential management tools for diabetes management. Refer to the appropriate resources; dietitian, physician, or certified diabetes educator when appropriate.

C. Counseling Points

1. Eat a variety of foods from all the food groups.

2. Do not skip meals and try to eat like amounts of food for breakfast, lunch and dinner rather than one or two large meals.

3. Have sugar in moderation. Use foods made with sugar substitutes to save calories and assist with blood glucose levels.

4. Eat fewer fried and fatty foods. Select leaner cuts of meat and trim off excess fat. This can help with weight management and heart disease.

5. Lose weight if you need to. Even losing 10-15 pounds can improve blood glucose control.

6. Increase physical activity. Being more active can help regulate blood glucose levels, weight management, and helps your body use insulin better.

D. Nutrition Care Plan

Document assessment, education, client's behavior change goal, referral, and follow up if needed.

E. Referral

Clients with abnormal or high blood glucose values should be referred to their primary care physician for follow up care.

F. Additional Resources

The American Diabetes Association — www.diabetes.org
The American Dietetic Association — www.eatright.org

XI. Cholesterol and Triglycerides

A. Background

It is estimated that there are 102.3 million American adults with a total blood cholesterol value of 200 mg/dL and higher, and about 41.3 million American adults with levels of 240 or above.

High blood cholesterol can lead to plaque formation within the arteries obstructing blood flow to the heart, brain, or other vital organs resulting in a heart attack or stoke. High blood cholesterol is a modifiable risk factor for heart disease and can be controlled through diet, exercise, and/or medication.

B. Cardiovascular Risk Factors

1. 65 years of age or older
2. male gender
3. heredity and race
4. Modifiable risk factors
   - **a.** tobacco smoke
   - **b.** high blood cholesterol
   - c. high blood pressure
   - d. physical inactivity
   - **e.** overweight and obesity
   - **f.** diabetes

C. National Cholesterol Education Program Guidelines

It is preferable to measure both high-density lipoprotein (HDL) cholesterol as well as total cholesterol. If total cholesterol is 200 mg/dL or higher or HDL cholesterol is less than 40 mg/dL, a lipoprotein profile should be done or client should be referred to a care provider for follow-up testing and evaluation. The following lab results are for those with no more than one risk factor for heart disease. Those with additional risk factors have stricter cut off values.

Cholesterol and Triglycerides		
For people with no more than one risk factor for heart disease:		
Total cholesterol	Desirable:	• less than 200 milligrams per deciliter (mg/dL)
	Borderline high:	• 200–239 mg/dL
	High:	• 240 mg/dL and greater
HDL cholesterol	High (desirable):	• greater than 60 mg/dL
	Acceptable:	• 40–60 mg/dL
	Low:	• less than 40 mg/dL
LDL cholesterol	Optimal:	• less than 100 mg/dL
	Near optimal:	• 100–129 mg/dL
	Borderline high:	• 130–159 mg/dL
	High:	• 160–189 mg/dL
	Very high:	• 190 mg/dL and greater
Triglycerides	Normal:	• less than 150 mg/dL
	Borderline high:	• 150–199 mg/dL
	High:	• 200–499 mg/dL
	Very high:	• greater than 500 mg/dL
The National Cholesterol Education Program (NCEP) of the National Institutes of Health (NIH) provides the figures in this table. Go to: http://www.nhlbi.nih.gov/guidelines/cholesterol/atglance.htm		

D. Homocysteine and B Vitamins

Homocysteine is an amino acid in the blood. Epidemiological studies have shown that an elevated homocysteine level is an independent risk factor for cardiovascular disease and stroke. Studies suggest that homocysteine may have an effect on atherosclerosis by damaging the inner lining of arteries and promoting blood clots.

Plasma homocysteine levels are strongly influenced by diet, as well as by genetic factors. A deficiency of folic acid, vitamin B6, or B12 may increase homocysteine levels in the body. Other recent evidence shows that low levels of folic acid are linked with a higher risk of coronary heart disease and stroke.

Currently there are no recommendations for supplementation of folic acid and B vitamins for the prevention of atherosclerosis, and therefore eating a diet rich in these nutrients is recommended. High doses of B6 from supplements can lead to neuropathy leading to nerve damage in the legs and arms.

Foods high in folic acid include green, leafy vegetables and grain products fortified with folic acid. Foods high in vitamin B6 include fortified cereals, baked potatoes, bananas, salmon, chicken, pork and tuna. Foods high in vitamin B12 include animal products like dairy foods, eggs and meats. High doses of folic acid can mask a B12 deficiency. Untreated B12 deficiencies can result in irreversible nerve damage.

E. Triglycerides

Triglycerides are fats derived from food eaten or made in the body from excess carbohydrates. High triglycerides are linked to coronary artery disease and untreated diabetes. Triglycerides can be lowered through weight reduction, reduced alcohol intake, and reducing total saturated fat and cholesterol in the diet

F. Dietary Recommendations / Counseling Points

1. Read food labels and look for foods lower in fat (less than 3 grams per servings) and saturated fat (less than 1 gram per serving).
2. Animal products like meat and dairy products contain varying amounts of cholesterol. Buy leaner cuts of meat like round or loin cuts. Cut off all visible fat.
3. Broil, grill or bake meats rather than frying or pan-fry.
4. Modify recipes to reduce fat. Use half of the recommended oil; use lower fat alternatives for sour cream, mayo, or whipped cream. Use nonfat yogurt or whipped topping made from skim milk.
5. Limit egg consumption to 3-4 whole eggs per week. Try using 2 egg whites instead of one yolk for recipes and omelets.
6. Down size portion sizes. Three ounces of meat is a standard serving, the size of a deck of cards.
7. Since animal products are the greatest contributors to saturated fat and cholesterol in the diet, limit these and increase bean and vegetable consumption.
8. Increase intake of omega-3 fatty acids by eating fish like salmon and tuna twice a week.

G. Nutrition Care Plan

Document assessment, education, client's behavior change goal, referral and follow up if needed.

H. Referral

Clients with borderline high blood cholesterol with two or more risk factors, and clients with high blood cholesterol should be referred to their physician for follow up care.

Refer as appropriate to reputable weight loss program, dietitian, and smoking cessation classes.

XII. Additional Nutrition Resources

The listed websites are only a sample of various nutrition web sites providing nutrition information. The content is not reviewed by or endorsed by CDPHE.

The American Dietetic Association	www.eatright.org
USDA Nutrition website	www.nutrition.gov
The American Diabetes Association	www.diabetes.org
The American Heart Association	www.americanheart.org
WebMd (nutrition info provided by the ADA)	www.webmd.com
Nutrition Education for New Americans Project (education materials in 37 languages)	http://monarch.gsu.edu/multiculturalhealth/
NIH Weight management	http://www.nhlbi.nih.gov/health/public/heart/obesity/lose_wt/index.htm
U.S. FDA Nutrition information for women	http://vm.cfsan.fda.gov/~dms/wh-toc.html
March of Dimes	www.modimes.org
Folic Acid	www.folicacid.net
National Dairy Council (education materials)	www.nationaldairycouncil.org/
Colorado State University (education materials)	www.ext.colostate.edu/