Back To Chiropractic CE Seminars

Labs for the DC: Hyperlipidemia
2 Hours

- Presented by John B. Campise, D.C.-

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This course counts toward your California Board of Chiropractic Examiners CE. (also accepted in other states, check our website or with your Chiropractic State Board). The California Board requires that you complete all of your CE hours **BEFORE** the end of your Birthday month. We recommend that you send your chiropractic license renewal form and fee in early to avoid any issues.

Exam Process: Please read all instructions before starting!

1. You must register/pay first. If you haven't, please return to: backtochiropractic.net

2. Open a new window or a new internet tab & drag it so it's side-by-side next to this page.

3. On the new window or new tab you just opened, go to: backtochiropractic.net website.

4. Go directly to the Online section. DON'T register again.

5. Click on the Exam for the course you want to take. No passwords needed.

6. Follow the Exam instructions.

7. Upon passing the exam you'll be able to immediately download your certificate,

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Please retain the certificate for 4 years. If you get audited and lose your records, I'll have a copy.

I'm always a phone call away... 707.972.0047 or email: marcusstrutzdc@gmail.com -Marcus Strutz, DC, Back To Chiropractic CE Seminars

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John B. Campise, Doctor of Chiropractic

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EDUCATION

-Doctor of Chiropractic, March 2001 – Life Chiropractic College West, Hayward, CA
-Undergrad 90 quarter hours, June 1997 – Santa Clara University, Santa Clara, CA

CHIROPRACTIC TECHNIQUE ADVANCED STUDY

-Neuro-Emotional Technique Certification, January 2006, Dr. Scott Walker, D.C., NET, Inc., Carlsbad, CA

-Applied Kinesiology Certification, May 1999, Tim Francis, D.C., ICAK USA, Sunnyvale, CA

-Carrick Institute Chiropractic Neurology Diplomate Course: 250 hours audited, May 1999

John B. Campise, Doctor of Chiropractic

CONFERENCE PRESENTATIONS

-Neuro-Emotional Technique “Success Seminars” 25th Anniversary. *24 hour clock acupuncture theory correlations to NET and homeopathic support of the chiropractic adjustment.*

CHIROPRACTIC PRACTICE

-Campise Chiropractic private practice, June 2001 - Present, Fresno, CA. General Practice with a focus on nutrition, wellness, and rehabilitation of traumatic brain injuries.

-Dr. Kotsonis, D.C., DACNB Chiropractic Office, Jan 2015 - Dec 2015, Clinton Township, MI. General practice with a focus on stroke rehabilitation. For 2 weeks every month Dr. Campise was trained by and filled in for Dr. Kotsonis while he recovered from lumbar spinal fusion surgery.

Legal Disclaimer

Please be advised that everything contained within this PowerPoint and/or within this lecture is not intended to be clinical advice, counseling or advice for any patient.
The examples contained herein are for the comprehension of nutrition/labs and is intended for nothing other than informative continuing education purposes.
All protocols herein should not be used until proper history, exam and special studies have been completed and assessed.

Hyperlipidemia

Hyperlipidemia

What is hyperlipidemia?

-Hyperlipidemia is when a patient has elevated levels of cholesterol (usually assumed when the lipo-protein LDL is elevated) or elevated levels of triglycerides in their blood.

-Hyperlipidemia can be a risk factor for cardiovascular disease.

Hyperlipidemia

Lipo-proteins

High Density (HDL)

Low Density (LDL)

Very Low Density (VLDL)

Intermediate Density (IDL)

Lipoprotein a {Lp (a)}

Chylomicrons (CM)

Triglycerides

Dietary fats absorbed by small intestine.

Fats produced by liver from excess dietary calories or from liver glycogen stores.

Fats released from adipocytes.

A source of energy for cells.

Cholesterol

80% is made by the liver 20% comes from diet.

Precursor to steroid hormones and vitamin D.

Strengthens cell membranes.

Needed to make bile.

Involved in various immune system functions.

Hyperlipidemia

Clinical Overview

Lipo-proteins

- Triglycerides and cholesterol are hydrophobic (“afraid of water” or not water soluble) and so they cannot travel through the bloodstream safely without being transported by lipo-proteins.

- There are 8 types of lipoproteins but usually only 2 of them are tested routinely on blood panels (HDL and LDL) with 2 others being tested occasionally {VLDL and Lp(a)}

Hyperlipidemia
Clinical Overview

Triglycerides

- Three fatty acids + one glycerol backbone = one triglyceride

- A source of energy for cells.

- LDL carries triglycerides from the liver to the adipocytes for storage.

- HDL carries triglycerides from the adipocytes to the body tissues to burn for energy.

Hyperlipidemia
Clinical Overview

Cholesterol

- The body makes vitamin D with the help of UVB from sunlight from cholesterol. Steroid hormones (cortisol, testosterone, estrogen, progesterone, aldosterone, DHEA) are made from cholesterol.

- Cholesterol is a required ingredient in the production of bile by the liver which helps emulsify dietary fats which is required for their absorption including the fat soluble vitamins like A, D, E, and omega 3.

- Cholesterol is carried in the blood by lipoproteins.

Hyperlipidemia

Causes

1) Dietary stress
2) Hereditary factors

Hyperlipidemia

Causes

1) Dietary stress: There has been confusion around which foods cause hyperlipidemia. The CDC website says:

“Limit foods high in saturated fat. Saturated fats come from animal products (such as cheese, fatty meats, and dairy desserts) and tropical oils (such as palm oil). Foods that are higher in saturated fat may be high in cholesterol.”

Hyperlipidemia

Causes

1) Dietary stress: Essentially the CDC hypothesis goes like this: Saturated fats tend to be in foods that are high in cholesterol. Eating cholesterol increases cholesterol.
The trouble with this hypothesis is that 80% of the cholesterol in your blood was made by your liver. High cholesterol blood levels are usually because your liver made too much. Why would it do that?

Hyperlipidemia

Causes

1) Dietary stress:

"When you ingest fructose in high amounts without the associated fiber found in whole fruit, it turns on the cholesterol-producing factory in your liver called *lipogenesis* which makes super dangerous small LDL particles, jacks up your triglycerides, and lowers the HDL (or good) cholesterol. So does sugar in any form, including flour and refined carbs."

https://drhyman.com/blogs/content/7-ways-to-optimize-cholesterol

Hyperlipidemia

Causes

1) Dietary stress:

So in other words there is a fight between competing hypotheses:

A) Eating cholesterol rich foods causes hyperlipidemia,

OR

A) Eating sugar, especially fructose, causes the liver to overproduce cholesterol, causing hyperlipidemia.

Hyperlipidemia

Causes

2) Hereditary Factors:
If hyperlipidemia runs in your family (Familial Hyperlipidemia or FH) then it is presumed to be caused by a genetic disorder, but often patients are not tested for whether they actually have the gene or not. **True cases of Familial Hyperlipidemia often don't respond well to dietary treatments (eating low fat foods or eating low sugar and low carb foods).**

Hyperlipidemia

Fun Fact:
ASCVD = Atherosclerotic cardiovascular disease

Causes

2) Hereditary Factors:
https://testdirectory.questdiagnostics.com/test/test-guides/TS_FH/familial-hypercholesterolemia

"According to International Atherosclerosis Society guidelines, clinical diagnostic criteria for FH include personal or **family history of premature ASCVD**, physical findings of **tendon xanthomas** (yellowish patches or lumps of cholesterol buildup in the tendons of the hands, feet, and heel) or **corneal arcus** (opaque ring in the corneal margin), and **elevated LDL-C**."

Hyperlipidemia

Fun Fact:

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3070150/

"Low-density lipoprotein (LDL) is conventionally quantified in terms of the mass of cholesterol carried by these particles. LDL cholesterol (LDL-C) has been the standard measure of LDL and LDL-attributable cardiovascular disease (CVD) risk for so long that "LDL" and "LDL-C" tend to be used interchangeably."

Hyperlipidemia

Fun Fact:

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3070150/

"The amount of cholesterol per LDL particle is variable and related in part to particle size, with smaller particles carrying less cholesterol. This variability causes concentrations of LDL cholesterol (LDL-C) and LDL particles (LDL-P) to be discordant in many individuals."

Hyperlipidemia

Fun Fact:
FH = Familial Hyperlipidemia

Causes

2) **Hereditary Factors**:
https://testdirectory.questdiagnostics.com/test/test-guides/TS_FH/familial-hypercholesterolemia
"...**genetic testing** alone can provide a definitive diagnosis. An international expert panel convened by the FH Foundation recommends testing for variants in the 3 genes most commonly associated with FH: ***LDLR***, ***APOB***, and ***PCSK9***. Loss-of-function variants of *LDLR* are the most common (79% to 88% of FH cases), followed by loss-of-function variants of *APOB* (5% to 13%) and gain-of-function variants of *PCSK9* (<1%)."

Hyperlipidemia

Signs and Symptoms

Mild to moderate and acute severe hyperlipidemia:

- ***there are no signs or symptoms.*** This is why lipid panels are used routinely on most medical patients.

Chronic severe hyperlipidemia cases may have:

- **tendon xanthomas**

(yellowish patches or lumps of cholesterol buildup in the tendons of the hands, feet, and heel)

- **corneal arcus**

(opaque ring in the corneal margin)

Hyperlipidemia

We will cover the basic panel in this course!

Labs to order:

- **Basic Lipid Panel (Total Cholesterol, HDL, LDL, Triglycerides)**
- **Advanced Lipid Panels (VLDL, lipoprotein (a), apolipoprotein B, LDL Particle Number, LDL Small, LDL Medium, HDL Large, LDL Pattern, LDL Peak Size, LDL P, Small LDL P, LDL Size, HDL P, Large HDL P, HDL Size, Large VLDL P, VLDL Size)**

Hyperlipidemia

Fun Fact:

dL = deciliter

1 liter = 10 deciliters

Labs Findings and Interpretation:

Total Cholesterol will tend to be HIGH.

Total Cholesterol **normal** range:

100-199 mg/dL (Labcorp)

Hyperlipidemia

Labs Findings and Interpretation:

LDL will tend to be HIGH.

LDL **normal** range:

0-99 mg/dL (Labcorp)

Hyperlipidemia

Labs Findings and Interpretation:

HDL will tend to be LOW.

HDL **normal** range:

>39 mg/dL (Labcorp)

HDL **optimal** range:

>60 mg/dL (Functional Medicine)
https://drhyman.com/blogs/content/podcast-ep856

Hyperlipidemia

Labs Findings and Interpretation:

Triglycerides will tend to be HIGH.

Triglycerides **normal** range:

0-149 mg/dL (Labcorp)

Triglycerides **optimal** range:

<70 mg/dL (Functional Medicine)
https://drhyman.com/blogs/content/podcast-ep856

Hyperlipidemia

Labs Findings and Interpretation:

Triglycerides to HDL ratio will tend to be HIGH.

Triglycerides/HDL ratio **normal** range: **<2.0**

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10001260/

Hyperlipidemia

Labs Findings and Interpretation:

Triglycerides/HDL ratio below 2.0 is a much better marker for cardiovascular disease and metabolic syndrome than is total cholesterol and LDL levels.

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10001260/

Hyperlipidemia

Labs Findings and Interpretation:

What is Triglycerides/HDL ratio?

It's not a specific lab to order, it is a calculation performed by the practitioner.

Triglycerides divided by HDL:

$$\frac{\textbf{Triglycerides}}{\textbf{HDL}} = \textbf{TG/HDL ratio}$$

Hyperlipidemia

RED = Flagged by the lab as out of range

Labs Findings and Interpretation:

What is Triglycerides/HDL ratio?

Example 1:

Total Cholesterol = 228 (normal <199)

HDL = 83 (normal >39)

LDL = 145 (normal <99)

Triglycerides = 86 (normal <149)

TG/HDL ratio =
86 divided by 83 = 1.04

Since a ratio below 2.0 is correlated with low risk for cardiovascular disease, this patient's high total cholesterol and high LDL numbers are very likely of no concern.

Hyperlipidemia

RED = Flagged by the lab as out of range

Labs Findings and Interpretation:

What is Triglycerides/HDL ratio?

Example 2:

Total Cholesterol = 195 (normal <199)

HDL = 35 (normal > 39)

LDL = 160 (normal <99)

Triglycerdies = 137 (normal <149)

Before going to the next slide, try calculating the TG/HDL ratio and decide whether the high LDL in this example is of concern or not.

Hyperlipidemia

Answer!

Labs Findings and Interpretation:

What is Triglycerides/HDL ratio?

Example 2:

Total Cholesterol = 195 (normal <199)

HDL = 35 (normal > 39)

LDL = 160 (normal <99)

Triglycerides = 137 (normal <149)

TG/HDL ratio =

137 divided by 35 = 3.91

Since a 3.91 ratio is higher than 2.0, then likely the high LDL is of concern and treatment to either lower the LDL or to lower the TG/HDL ratio is warranted.

Hyperlipidemia

RED = Flagged by the lab as out of range

Labs Findings and Interpretation:

What is Triglycerides/HDL ratio?

Example 3:

Total Cholesterol = 245 (normal <199)

HDL = 65 (normal > 39)

LDL = 180 (normal <99)

Triglycerides = 110 (normal <149)

Before going to the next slide, try calculating the TG/HDL ratio and decide whether the high LDL and high Total Cholesterol in this example is of concern or not.

Hyperlipidemia

Answer!

Labs Findings and Interpretation:

What is Triglycerides/HDL ratio?

Example 3:

Total Cholesterol = 245 (normal <199)

HDL = 65 (normal >39)

LDL = 180 (normal <99)

Triglycerides = 110 (normal <149)

TG/HDL ratio =

110 divided by 65 = 1.69

Since a 1.69 ratio is lower than 2.0, then likely the high LDL and high total cholesterol is NOT of concern. But an advanced lipid panel should be ordered if unsure.

Hyperlipidemia

Labs Findings and Interpretation:

What is Triglycerides/HDL ratio?

The way to remember the formula for math nerds: We know that triglycerides are BAD and HDL is GOOD which means we want the lowest possible triglycerides and the highest possible HDL. When we divide two numbers the lower the number on top (numerator), the lower the answer. The higher the number on the bottom (denominator) the lower the answer. We want the ratio to be as low as possible (< 2.0) so we must put the triglycerides on the top and divide by the HDL.

Hyperlipidemia

Labs Findings and Interpretation:

What is Triglycerides/HDL ratio?

Triglycerides divided by HDL.

The way to remember the formula for normal people:

“Glide to the top to get high on the down low.”

Tri-GL-ycer-IDE-s go on top and HDL goes on the bottom.

Glide to the top to get high on the down low.

Hyperlipidemia

Labs Findings and Interpretation:

Advanced Lipid Panels:

These mainly test particle sizes.

Generally you want large fluffy particles.

The small dense ones are the bad ones.

Hyperlipidemia

Medical vs Alternative Treatment Options:

Medical: (1)

Statins: Block cholesterol production in the liver.

Possible side effects: **Muscle aches and pains**, low energy (due to interference with mitochondrial function.)

Attention Chiropractors!

Hyperlipidemia

Medical vs Alternative Treatment Options:

Medical: (2)

Ezetimibe: Prevents cholesterol from being absorbed in the small intestine.

Possible side effects: Sinus infection, diarrhea, **joint pain**, **back pain, muscle pain, arm and leg pain**.

Attention Chiropractors!

Hyperlipidemia

Medical vs Alternative Treatment Options:

Medical: (3)

Bile Acids Sequestrants: Cause the intestines to reabsorb less bile and thus pass more cholesterol in the stool.

Possible side effects: Bloating, abdominal pain, constipation, interferes with absorption of other medication.

Hyperlipidemia

Medical vs Alternative Treatment Options:

Medical: (4)

PCSK9 Inhibitors: Blocks PCSK9 proteins from breaking down LDL receptors in liver, effectively increasing their number. These receptors bind to LDL so that the liver can break down the LDL.

Possible side effects: Fatigue and **muscle pain**.

Attention Chiropractors!

Hyperlipidemia

Attention Chiropractors!

Medical vs Alternative Treatment Options:

Medical: (5)

ACLY Inhibitors: Blocks the production of cholesterol and fatty acids in the liver. Have only been FDA approved since 2020.

Possible side effects: **Tendon pain, back pain**, stomach pain, cold or flu like symptoms.

Hyperlipidemia

Medical vs Alternative Treatment Options:

Medical: (6)

Fibrates: Activates peroxisome proliferator-activated receptors (PPARs), mainly lowers triglycerides.

Possible side effects:Abdominal pain, constipation, diarrhea, dizziness, leg cramps, **headaches**.

Attention Chiropractors!

Hyperlipidemia

Medical vs Alternative Treatment Options:

Alternative: (1) Eliminate sugar from the diet and reduce refined carbohydrates (bread, rice, pasta, crackers, etc).

Find the patient's carbohydrate tolerance with the Two Week Test: https://philmaffetone.com/2-week-test/

Hyperlipidemia

Medical vs Alternative Treatment Options:

Alternative: (2) Encourage patient's white muscle fibers to convert into red muscle fibers via maximal aerobic function exercise.

Dr. Phil Maffetone's 180 Formula:
https://philmaffetone.com/180-formula/

Hyperlipidemia

Sucrose is 50% Fructose

Medical vs Alternative Treatment Options:

Alternative: (3) “When you ingest fructose in high amounts without the associated fiber found in whole fruit, it turns on the cholesterol-producing factory in your liver called *lipogenesis* which makes super dangerous small LDL particles, jacks up your triglycerides, and lowers the HDL (or good) cholesterol. So does sugar in any form, including flour and refined carbs.”

https://drhyman.com/blogs/content/7-ways-to-optimize-cholesterol

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