Welcome to Meeting 7: Diabetes and Cholesterol. Today we will talk about the importance of balancing cholesterol, what cholesterol numbers should be to prevent problems, and how to get cholesterol in balance.

Before we get started, let’s hear what Uncle Tommy is going to learn about cholesterol.
Uncle Tommy is meeting with his doctor for a check-up today. Dr Brady has been Uncle Tommy’s doctor for many years. Today Dr. Brady and Uncle Tommy will discuss lab results. Let’s see how the visit goes.

“Good morning Tommy! How are you?” asked Dr. Brady. Uncle Tommy replied, “I feel pretty good today.” “That’s great”, said Dr. Brady. Your lab results were really impressive this time. Your hemoglobin A1c was 7.5% and your blood pressure was 135 over 86. You’ve really improved your blood sugar and blood pressure. The medicines seem to be working well. Have you been able to increase your exercise?”

“Yes,” said Uncle Tommy, “Kaipo is helping me. We play a little soccer and walk for half an hour almost every day. My wife is helping me with the diet. We’re trying to eat more foods with fiber, like whole wheat bread, brown rice, and vegetables. . .like you and the dietician recommended.”

“Fantastic!” exclaimed Dr. Brady. “Let’s go over the results for your cholesterol. There is a total cholesterol number, one for LDL and one for HDL, and one for triglycerides. Triglycerides are another kind of fat we test for. We want HDL to be high because it is a good cholesterol, but we want LDL and triglycerides to be low because they are the ones that can cause heart problems.”
Dr. Brady showed Uncle Tommy the results and explained, "Here is a table with your results and the recommended goals for each of the lab results. As you can see, your total cholesterol, LDL, and triglycerides are higher than they should be, but your HDL, what we call the good cholesterol, is good because it’s over 40.

<table>
<thead>
<tr>
<th>Test</th>
<th>Laboratory Results</th>
<th>Goal</th>
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</thead>
<tbody>
<tr>
<td>Total Cholesterol</td>
<td>235</td>
<td>Lower than 200</td>
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<tr>
<td>LDL</td>
<td>190</td>
<td>Lower than 100</td>
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<tr>
<td>HDL</td>
<td>45</td>
<td>Higher than 40 for men; higher than 50 for women</td>
</tr>
<tr>
<td>Triglycerides</td>
<td>170</td>
<td>Lower than 150</td>
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"Exercising and eating healthy has certainly helped and you should keep doing them. But sometimes our body needs a little help so I’m going to prescribe a cholesterol medication to help lower your LDL. The generic name is Atorvastatin, or you may have heard the brand name of Lipitor. The medication will help lower the total cholesterol number too. The cholesterol medications, combined with exercise and healthy eating, can really help to lower cholesterol. Do you have any questions for me today?" asked Dr. Brady as he wrote the prescription.
Uncle Tommy asked, “How long will I need to take the cholesterol medication for?”

Dr. Brady replied, “At your next visit in 3 months, I will review your lab tests again and we will see how it’s going. Then we can decide if you need to keep taking them. Sometimes high cholesterol is hereditary so even skinny people can have high cholesterol. But for others, a healthy diet and exercise can lower cholesterol. Just remember to eat fewer foods that have a lot of fat in them. Try to eat more fish, lean meat, and vegetables.”

“Thank you Dr. Brady,” smiled Uncle Tommy. “It was good to see you and keep up the good work. You’re doing great! See you in a few months, and tell Kaipo I said hello.” said Dr. Brady.
Diabetes is one condition, but along with it often comes others that can put your health at risk. Diabetes can also affect cholesterol levels.

At our last meeting we talked about the importance of keeping blood pressure in balance (130/80 or lower) to avoid heart problems. Keeping cholesterol in balance is another important part of preventing heart problems. Today we will talk about cholesterol and how to keep it in balance.

Cholesterol is a waxy fat found in the blood. Our bodies need cholesterol to help make many things inside our bodies, such as hormones, parts of cells, and nerve tissue. The liver makes some of the cholesterol in your blood. The rest comes from the foods we eat.

Animal-based foods are major sources of dietary cholesterol. High fat meat and poultry, organ meats, whole fat dairy (such as cheese and milk), and the yolks of eggs are high in cholesterol.
Eating too many foods that are high in fat and cholesterol can raise cholesterol levels. Eventually, thick cholesterol builds up and clogs the blood vessels so that blood has a hard time passing through them. If the blood supply to the heart is restricted, a heart attack may result. If the blood supply to the brain is restricted, a stroke can result.

Like high blood pressure, high blood cholesterol has no signs or symptoms, so you may not know if you have high cholesterol unless you get a blood test.

There are two kinds of cholesterol and another fat that you should know about. These are:

- HDL cholesterol – the GOOD cholesterol 😊
- LDL cholesterol – the BAD cholesterol 😞
- Triglyceride – the BAD fat 😞

Diabetes tends to lower “good” cholesterol and raise “bad” cholesterol.
**Good Cholesterol**

HDL stands for high-density lipoprotein cholesterol. HDL cholesterol is the good cholesterol because it seems to lower a person’s risk of heart attack and stroke by keeping blood vessels clear. Usually a higher HDL cholesterol number is better.

For **men**, it is best if **HDL is higher than 40**.

For **women**, it is best if **HDL is higher than 50**.

One of the best ways to increase HDL cholesterol is with exercise. Everyone should be doing some type of exercise everyday for at least 20 minutes or more.

**Bad Cholesterol**

LDL cholesterol, also called low-density lipoprotein, is the bad cholesterol. Too much LDL cholesterol can cause plaque to build up on the artery walls and limit the flow of blood to the heart.

It keeps the blood from flowing freely through the blood vessels to the heart. The higher the LDL number, the more dangerous it is for the heart.

Do you remember the goal for LDL?
### Total Cholesterol

A healthy **LDL** cholesterol number should be **lower than 100**.

The total cholesterol number should be **lower than 200**. Total cholesterol is **HDL + LDL added together**.

### Triglycerides

Triglyceride is a type of blood fat. This fat can be found in some kinds of margarine, simple sugars like candy and desserts, and alcohol.

The **triglyceride** number should be **lower than 150**. It is even better if it is lower than 100.

High levels of triglycerides and LDL cholesterol in the bloodstream can be very dangerous for the heart.

Do you know what your cholesterol and triglyceride numbers are?
If you do not know your cholesterol and triglyceride levels, ask your provider to check your cholesterol (HDL and LDL) and triglyceride numbers once a year. Have your health care provider explain the numbers to you. Then, if necessary, set a goal and talk with your provider to develop a plan to lower cholesterol.

If you are given medicine to lower your cholesterol and triglycerides, you may need to have your numbers checked more than one time a year.

Healthy cholesterol numbers are:

- HDL higher than 40 for men, higher than 50 for women
- LDL lower than 100
- Total cholesterol lower than 200
- Triglyceride lower than 150 – better if lower than 100
Eat Healthy to Keep Cholesterol in Balance

Our bodies need some fat and cholesterol, but we often eat too much fat and cholesterol. We also may eat too many foods with saturated fat. Eating too many foods with saturated fat can lead to a build-up of cholesterol in the blood vessels and restrict blood flow.

To keep your heart healthy and blood flowing, it is best to eat fewer high fat foods, especially those that contain saturated fat.

Some foods that contain saturated fat that should be eaten in moderation are:

- High fat dairy products, such as whole milk and cheese, butter, ice cream
- Egg yolks
- Liver and other organ meats
- High fat meats and poultry, such as chicken thighs and duck

What are some foods you could eat instead?

<table>
<thead>
<tr>
<th>Food 1</th>
<th>Food 2</th>
<th>Food 3</th>
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There are also good fats that can help protect your heart by lowering cholesterol. Here are some good fats to look for on food labels.

1. **Monounsaturated fat** is one kind of unsaturated fat that can lower cholesterol. Sources of monounsaturated fat are:
   - Avocado
   - Canola oil
   - Nuts like almonds, cashews, pecans
   - Olive oil and olives
   - Peanut butter
   - Sesame seeds

2. **Polyunsaturated fat** can also protect your heart. Sources of polyunsaturated fat are:
   - Corn, cottonseed, safflower, soybean, or sunflower oil
   - Walnuts
   - Pumpkin or sunflower seeds
   - Soft margarine
   - Low fat or fat free mayonnaise and salad dressings

3. **Omega-3 fatty acids** can help prevent clogging of the arteries. Some types of fish are high in omega-3 fatty acids. Eating fish 2 or 3 times a week can help lower cholesterol and fat. Try broiling, baking, grilling, or steaming the fish to keep it low fat and healthy.
Eating more high fiber foods, such as vegetables and whole grain bread, is another great way to lower cholesterol and keep your heart healthy. Fiber gives a feeling of fullness in the stomach. If you feel full, you may not eat as much. This can control weight and cholesterol.

Fiber can also act like a shield against some bad fats. For example, fiber is able to lower cholesterol and triglyceride levels in certain foods by blocking their absorption in the body.

Exercise can help with cholesterol too. Regular physical activity can raise good cholesterol (HDL) and lower bad cholesterol (LDL).

Even a small weight loss of 10 pounds or less can help to lower your blood sugar, blood pressure, and triglyceride and cholesterol numbers.
Just as Dr. Brady told Uncle Tommy, sometimes our body needs help to lower cholesterol. Cholesterol-lowering medications can help keep blood vessels clear and blood flowing normally. Below is a chart of some types of cholesterol medicine for your information.

### Cholesterol Medicine

<table>
<thead>
<tr>
<th>Type of Medicine</th>
<th>Generic Name (Brand Name)</th>
<th>How it works</th>
<th>Possible Side Effects</th>
</tr>
</thead>
</table>
| **Statins**      | Atorvastatin (Lipitor)    | Lowers LDL (bad) cholesterol and triglycerides, and modestly raises HDL (good) cholesterol | • Muscle soreness, pain and weakness  
• Gas  
• Diarrhea  
• Constipation  
• Stomach pains  
• Liver problems |
|                  | Fluvastatin (Lescol)      |              |                       |
|                  | Lovastatin (Mevacor)      |              |                       |
|                  | Pravastatin (Pravachol)   |              |                       |
|                  | Rosuvastatin Calcium (Crestor) |          |                       |
|                  | Simvastatin (Zocor)       |              |                       |
| **Fibrates**     | Bezafibrate (Bezalip)     | Lowers triglycerides, raises HDL cholesterol | • Upset stomach  
• Diarrhea  
• Anemia  
• Increased risk of gallstones |
|                  | Fenofibrate (Lofibra, Tricor, Triglide, Antara) | |                       |
|                  | Gemfibrozil (Lopid)       |              |                       |
| **Niacin**       | Nicotinic Acid (Niaspan)  | Lowers triglycerides and LDL, and raises HDL cholesterol | • Redness of face or flushing of the face  
• Itching  
• Upset stomach  
• May worsen blood glucose control  
• Liver problems |
| **Resins**       | Cholestyramine (Questran, Prevalite, L-Cholest) | Lowers LDL; Sometimes prescribed in combination with Statins | • Constipation  
• Upset stomach  
• Diarrhea  
• Gas/Bloating  
• Heartburn  
• Dizziness |
|                  | Colestipol (Cholestid)    |              |                       |
|                  | Colesevelam (Welchol)     |              |                       |
Do you remember the goal for hemoglobin A1c?
________________________________________

How about for blood pressure?
________________________________________

To get your cholesterol in balance:

1. Work toward healthy cholesterol levels:
   - HDL higher than 40 in men, more than 50 in women
   - LDL lower than 100
   - Total cholesterol lower than 200
   - Triglyceride lower than 150 (better if lower than 100)

2. Eat more fiber and less fat and sugar

3. Be physically active

4. Set small reachable goals to get your cholesterol and triglyceride numbers in balance,

5. Take medicine(s) if prescribed

6. Work as a partner with your provider and diabetes team

Take a few minutes now to write down one goal that you plan to work on this week to get, or keep, your cholesterol in balance. Remember all that we have talked about today.
________________________________________
________________________________________
________________________________________
We appreciate that you have taken the time to be with us. Before you leave, please take a few minutes to give us your thoughts about today’s meeting.

1. As you were going through today’s meeting, what information did you find especially helpful to you?

2. What goal did you set for yourself?

3. Are there any other comments about today’s meeting that you would like to share with us?

Thank you!
On the next few pages, you will find a review of the key points from meetings 1-6, a list of questions you can ask your provider about cholesterol, and a list of cholesterol-related terms.

Thank you for coming to the meeting today. I look forward to seeing you at our next meeting when we will talk about healthy feet.

Be sure to bring your notebook with you.
Meeting 7

Review of Meetings 1-6, Questions and Dictionary
Diabetes and Cholesterol

By asking questions, you become an active partner in your health care. Here are a few questions that you may want to ask your provider.

1. What are my cholesterol numbers today?
2. Can we work on a plan together to get my cholesterol levels within the normal range?
3. When is the best time to take my cholesterol medicine?
4. What kind of results should I see with this medicine?
5. Are there any side effects from the cholesterol medicine?
6. How often should I have my cholesterol checked to see if the medicine is working?
7. If I forget to take my medicine and remember later in the day, when should I take it?
8. Will I always have to take cholesterol medicine?

These are just a few of the questions you may have about cholesterol. If you have other questions, write them down and take them with you to your next clinic visit. Remember, your provider will be happy to answer your questions and work with you as a partner in your health care.
<table>
<thead>
<tr>
<th>Term</th>
<th>Meaning of the Term</th>
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<tbody>
<tr>
<td>Arteries</td>
<td>Vessels that carry blood from the heart to the tissues.</td>
</tr>
<tr>
<td>Cholesterol</td>
<td>Fat found in the blood, muscle, liver, brain, and other tissues. Too much cholesterol can slow or stop blood flow. It is best if the total cholesterol number is lower than 200.</td>
</tr>
<tr>
<td>HDL (High Density Cholesterol)</td>
<td>Good cholesterol that should be higher than 40 for men and higher than 50 for women.</td>
</tr>
<tr>
<td>LDL (Low Density Cholesterol)</td>
<td>Bad cholesterol that should be lower 100.</td>
</tr>
<tr>
<td>Plaque</td>
<td>Fat that builds up in the arteries and blocks blood flow to the heart and brain.</td>
</tr>
<tr>
<td>Triglycerides</td>
<td>Another kind of fat in the blood. It should be lower 150. It is even better if it is lower than 100.</td>
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