Lesson 7: (ESOL) Talking About Symptoms to Your Doctor *

Disease Prevention and Screening Task Addressed in this Lesson
- Describe symptoms clearly and accurately to a doctor

Skills Focus
- Students will learn language expressions and adjectives for talking about symptoms.
- Students will develop communication strategies that can help them be as specific as possible about the nature of symptoms and the conditions under which symptoms appear.

ABE/ESOL Level
Intermediate to advanced ESOL

Time
2 hours

Materials
Student Handouts

Key Vocabulary

ache	inflammation	severe
constant	irritation	sharp
crusty	low energy	soreness
dull	mild	spotty
exhaustion	moderate	throbbing
frequent	occasional	tiredness
itchy	oozing	twinge

Purpose
This lesson is designed to help students learn how to describe their symptoms clearly and effectively. This lesson begins by inviting the students to discuss how talking to a doctor about a health concern is a lot like talking to a car mechanic about a problem with their car. This analogy provides a framework for helping students understand the value of being clear and specific.

Students practice using details about symptoms, including their character, duration, onset, and conditions. A chart of vocabulary words used to describe symptoms is provided.

Steps

1. **Whole class discussion.** Distribute the handouts. Ask students to look at the page titled **Talking about Symptoms to Your Doctor.** Discuss the question *How is talking to a car mechanic when you have a problem with your car a lot like talking to a doctor when you have a health problem*?

   Give students a few minutes to write down their thoughts. Then ask students to share what they've written with the whole class.

   (See possible responses below.)

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* Material in this lesson is adapted from lessons in *English Vocabulary in Use* (Michael McCarthy and Felicity O'Dell, 1994, Cambridge University Press) and information published by the American Automobile Association (AAA) Web site, *Communicating with Service Professionals at* http://www.csaa.com/home.

- *It's hard to know what's wrong with a car and what's wrong with our bodies sometimes. We have to explain a lot of things to a car mechanic and a doctor to figure out what is wrong.*
- *Sometimes the car mechanic doesn't understand what the problem is with the car. Sometimes the doctor also doesn't understand what the problem is with our body.*
- *Car mechanics and doctors both ask lots of questions.*
- *It can be hard to find words to describe noises and feelings or sensations.*

After students have had an opportunity share some of their ideas, explain that the topic of the day's lesson is how to talk to your doctor about your symptoms. Write the word **SYMPTOM** on the board and ask students to help you define the word. Encourage them to use their dictionaries and to translate the word into their first language.

Here is a suggested definition:
It's useful to think of symptoms as what the patient feels and signs as what the doctor observes. Symptoms, like tiredness (fatigue) and pain, are subjective experiences. (In contrast, signs, like abnormal pulse rate or high blood pressure, are objective features of an illness that can be detected by the doctor during a physical examination.) *The doctor cannot easily measure or observe symptoms. Only the patient knows exactly what his or her symptoms feel like. Doctors try to understand the nature and pattern of a patient's symptoms in order to make a diagnosis.*

2. **Small group work: Reading and discussion.** Organize the class into small groups of three to four people. Ask the groups to read the handout titled **Signs from Your Car, Signs from Your Body**. Explain that the reading talks more about the similarity between talking to your car mechanic and talking to your doctor. After the group reads the paragraph, they should answer the discussion questions from the handout.

   Encourage the students to use their dictionaries or ask for help with unfamiliar vocabulary. Record any new words and their meanings on the board for all to see.

   Check in with each group to make sure they do not have trouble understanding the ideas in the handout.

3. **Large group discussion: What does it mean to be CLEAR and SPECIFIC?**
   Invite the groups to share their responses to the discussion questions. Be sure to check the students' understanding of what it means to be CLEAR and SPECIFIC when describing your symptoms to a doctor. The more information you give to a doctor, the more likely the doctor will be able to identify the problem.

Be sure to recognize the students' worries and concerns about talking to a doctor about their symptoms. It is easy to be scared and nervous when talking to a doctor about your health, especially when you don't feel very well. At the same time, if you are too scared or nervous, you may not be able to think clearly, describe your symptoms effectively, or ask good questions.

Not all doctors are good listeners. Students will need help as they think about what to say to a doctor. They need practice asking questions and planning skills to decide what to focus on. Many people are assertive in this way when they talk to a car mechanic because they want their car fixed quickly and in the right way. This is a useful way of thinking about talking to doctors to avoid delays in getting health care.

4. **Small group work: Practice describing symptoms.** Ask students to turn to the handout **Practice: How to Describe Your Symptoms,** which features several questions that can help the students know what to say to the doctor about symptoms. Ask the students to work in their small groups to read the questions and the examples of things to say to a doctor. Ask the students to practice what they might say to a doctor.

Also, refer students to the handout **Vocabulary for Describing Symptoms,** which gives examples of words used to describe pain, tiredness, and rashes. Encourage the students to use the words from this handout in their descriptions. Encourage students to add other symptoms (e.g., fever, stress) and add other related nouns, verbs, and adjectives to the list. The follow-up activities in this lesson describe ways to use this handout for vocabulary development.

Follow-up Activities

A. Vocabulary for Describing Symptoms

Ask students to review the vocabulary in the handout **Vocabulary for Describing Symptoms,** and to use a dictionary to learn the meanings of any new words. Students can work in pairs to explore the differences in meaning for a group of words related to a particular symptom. Students can discuss, for example, how a **dull pain** feels different from a **sharp pain,** or how a **twinge** is different from a **throbbing pain.** Encourage students to come up with strategies for remembering these differences, such as ordering these words on a continuum to indicate severity of pain. For example, students might generate mnemonics such as this:

0		5		10
no pain	mild dull	moderate	throbbing	severe

Students can also work in pairs to generate descriptive words for other symptoms, such as shortness of breath, fever, stress, or anxiety. Be sure to have a dictionary and thesaurus on hand for each group.

B. Interview someone about their experiences with being sick and managing symptoms

Ask students to identify someone who has experience with being sick or managing a chronic disease. The students will interview the person about the range of symptoms the person had. This activity will help students understand the kinds of symptoms associated with particular illnesses or diseases. Here is a suggested interview protocol:

- Please tell me about the last time you were sick. (Please tell me about your chronic disease.)
- What were your symptoms?
- When did you notice the symptoms? (When did the symptoms start?)
- What were you doing when the symptoms started?
- Did the symptoms happen all the time (constant) or only sometimes? When did you have the symptoms (e.g., only at night)? How long did the symptoms last (a few seconds, an hour, a week)? What seemed to make the symptoms worse?
- Did the symptoms make it hard for you to do everyday activities (e.g., eat, sleep, and work)? How?
- Did you do anything to feel better? (Did you take any medicine? Did you rest?)
- If you went to a doctor, were you able to explain your symptoms to the doctor? How? Was the doctor able to help you feel better? How?

The students can summarize the person's responses into an oral presentation or a short descriptive essay. In a large group discussion, talk about common difficulties people have in understanding symptoms and talking to doctors about symptoms.

ABE/GED Teaching Tips

Even those students who are native English speakers or who were born in English-speaking countries will likely find this lesson useful and relevant. Many people – whether they speak English fluently or not – feel intimidated or unsure about what to say when they visit a doctor.

At a conference (Health and Literacy Working Together) organized by the Iowa New Readers,[*] adult learners shared concerns about not being able to communicate well with their doctors. These students wanted to tell their doctors, "Treat us with respect and we will treat you with respect." These students also wished their doctors would spend more time with them. They want their doctors to give them clear instructions, for example,

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[*] These comments were taken from conference proceedings but are not available on the Web. For more information about the conference, visit
http://www.ihi.org/IHI/Topics/Improvement/ImprovementMethods/Literature/HealthandLiteracyWorkingTogether.htm

when getting a new prescription. The students shared concerns about doctors who assume their patients understand their instructions and can read the documents they are given. The students were also concerned about the assumptions that doctors sometimes make about patients who cannot read well. The students asked that doctors not "feel sorry for us…we want (doctors) to try and understand us."

You may wish to share some of these comments with your ABE/GED students as a way to jumpstart the discussion of doctor-patient communication issues.

Technology Tips

Here are some suggested Web sites for learning more about patient-doctor communication and symptoms.

- ✓ **Talking With Your Doctor: A Guide for Older People, National Institute on Aging (NIA), part of the National Institutes of Health.**
  Features a section titled *What Can I Do? Tips for Good Communication.*
 http://mdchoice.com/Pt/consumer/talk.asp

- ✓ **Improve communication with your doctor, Women's Heart Foundation.**
  http://www.womensheartfoundation.org/content/HeartWellness/improve_doctor_patient_communication.asp

Talking About Symptoms to Your Doctor

1. **Warm-up.** Brainstorm with your classmates.
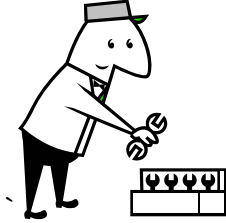
How is talking to a car mechanic
when you have a problem with your
car a lot like talking to a doctor when
you have a health problem?
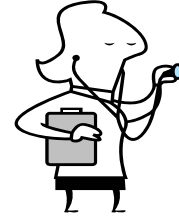
Write down your ideas. Share your ideas with your classmates.

2. **Short reading and discussion**

Read the handout titled **Signs from Your Car, Signs from Your Body** and answer
the discussion questions. Talk about your answers with your classmates.

Signs from Your Car, Signs from Your Body

You know your car better than anyone else does because you drive it every day. You know how it acts when it's running right. You also know when something is not quite right. When something is not right with your car, it sends you a signal. In the same way, you know what feels right with your body.

When something is not right with your body, it sends you a signal, just like a car does. The medical word for these signals is **symptoms**. A symptom is the way your body lets you know that something is not normal. A symptom may be a sharp pain or shortness of breath or a lack of energy.

Talking to a mechanic about problems with your car is a lot like talking to your doctor about problems with your health. A mechanic will ask you many questions to find out what is wrong with the car. If you say, "My car doesn't work," the mechanic will have to ask you many questions to figure out the problem. But, if you say, "My car makes a loud noise when I drive fast on the highway," this helps the mechanic find the problem faster. In the same way, your doctor can more easily figure out a health problem if you are CLEAR and SPECIFIC. If you say, "I feel sick," the doctor will have to ask you many questions to find out what is wrong. But, if you say, "I have a sharp pain in my arm when I try to write," you can help the doctor figure out the problem faster.

Discussion Questions

1. Think of a time when you or someone you know (a member of your family or a friend) was sick. What were the symptoms?

2. What can be difficult about talking to a doctor about your symptoms?

3. Why do you think it's important to clearly explain your symptoms to a doctor?

4. What are ways that you can be CLEAR and SPECIFIC when you talk to a doctor about your symptoms?

Practice: How to Describe Your Symptoms

It is useful to think about what to say to the doctor *before* you go to the doctor's office. Here are some questions that you can ask yourself. Your answers may help you be CLEAR and SPECIFIC when talking to your doctor about your symptoms.

- What is the symptom? (Is it a pain? Is it a rash? Is it a feeling of tiredness?)
- When did you notice the symptom? (When did the symptom start?)
- What were you doing when the symptom started?
- Does the symptom happen all the time (constant) or only sometimes? When do you have the symptom (e.g., only at night, when I'm moving)? What seems to make the symptom worse?
- How long does the symptom last (e.g., a few seconds, an hour)?
  How long have you had it (e.g., a week, a month)?
- Does the symptom make it hard for you to do everyday activities (e.g., eat, sleep, and work)? How?
- Are you doing anything to try to feel better? (Do you take any medicine? Do you rest?)

Here are some examples of how to describe symptoms:

"*Doctor, I have a red rash on my stomach. I saw the rash after dinner two nights ago. It hasn't gone away.*"

"*Doctor, I have a sharp pain in my lower back. I was lifting a heavy box at work a couple of weeks ago when I first felt the pain. I took some aspirin and the pain went away for a little while. The pain is getting worse.*"

"*Doctor, I have a mole on my left arm. The mole used to be small, but I think it looks bigger and darker. I work outside and I sometimes use sunscreen, but I often forget.*"

"Doctor, I have chills and feel very weak, especially in the late afternoon, before dinner."

Don't say, *"Doctor, I don't feel well. What's wrong with me?"*

Practice: Think of a time when you (or someone you know) didn't feel well or had a health problem. What were the symptoms? Imagine that you were going to talk to a doctor about the problem. Answer as many of the questions as you can that are listed in the handout titled **Practice: How to Describe Your Symptoms.**

What do you want to tell the doctor? You can use the handout titled **Vocabulary for Describing Symptoms** to find words for describing symptoms, such as pain, fatigue, or a rash. Use a dictionary or ask your classmates or your teacher for help with any new words.

If you want to talk about a symptom that is not on the list, fill in a blank row with the symptom and the other nouns, verbs, and adjectives you would use to describe it.

Vocabulary for Describing Symptoms

Symptom	Adjectives I can use to describe the NATURE of the symptom	Adjectives I can use to describe the DURATION of the symptom	Nouns with similar meaning	Expressions I can use to describe the symptom
pain	dull mild moderate severe throbbing sharp	constant occasional frequent	soreness ache twinge throbbing	I feel sore. It aches. It twinges. It throbs.
fatigue	severe mild moderate	constant occasional frequent	tiredness exhaustion low energy	I tire out. I am exhausted. I have low energy.
rash	spotty red itchy oozing crusty mild severe	occasional frequent	reaction inflammation itchiness irritation	I have a skin reaction. My skin is irritated. My skin is itchy. It flares up.

Lesson 8: (GED) Making Important Health Decisions

Disease Prevention and Screening Tasks Addressed in the Lesson
- Understand the purpose and process of colorectal cancer screening
- Make health-related and other types of important decisions
- Use a tool for making important decisions

Skills Focus
- Students will practice science-related reading.
- Students will review vocabulary related to colorectal cancer screening.
- Students will practice making a decision about health screening.
- Students will practice writing about a big decision they have faced.

ABE/ESOL Level
GED

Time (Two Sessions)
Session 1: 2 to 2½ hours
Session 2: 1½ hour

Materials
Watch or other timer
Handouts

Key Vocabulary

benign	cons
biopsy	option
cancerous	polyp
colon	pros
colonoscopy	tumor
colorectal	
complication	

Purpose

The purpose of this lesson is to provide students with an opportunity to explore the process of making important health-related decisions, in this case about health screening.

The lesson is designed as two sessions. In the first session, students learn about colorectal cancer and the colonoscopy test and then explore decision making through a role-play game. The second session focuses on the Ottawa Personal Decision Guide, a tool for making health and other important decisions. Students have an opportunity to practice using the guide and write about their own decision-making experiences.

Note to teachers: This lesson was designed around the question of whether or not to have a colonoscopy. You may wish to focus the lesson on some other type of screening (e.g., amniocentesis, HIV test) or health procedure that seems more relevant to your students and still requires a thoughtful decision process about participating in the test or procedure.

Session 1

1. **Introduction.** Start the class with a discussion prompt, such as the **Decisions, Decisions!** diagram included in this lesson. Show the prompt on an overhead transparency or copy it as a handout.

   Ask students the following question about the prompt:

   What makes these decisions difficult?
   e.g., They involve money; the consequences might last a long time; the course of action might be risky or might bring more problems than person has already, etc.

Ask students the following questions:

> *Think about a time in your own life when you faced a big decision.*
> *What made your decision difficult?*
> *What influenced your decision?*
> *What helped you make a decision?*
> *Were you happy with your decision? Why?*

Have students think for 1-2 minutes and then share stories in pairs for 5 minutes.

Have volunteers share some examples. Focus on influences and what helped with the decisions.   Keep a running list of influences on decision-making on the board or overhead transparency.

2. **Background Reading on Colorectal Cancer (Pairwork)** Explain that in this lesson, you will look at an example of a big decision that has to do with getting a health screening test. Share the following scenario with students:

> *William just turned 52. At his last check-up, his doctor suggested that William*
> *have a colonoscopy test. William is not sure whether or not to have the test. In*
> *the next activity, we are going to try to help William make that decision.*

Note that before students move on to discussing that decision, they will do a short reading to help them understand what a colonoscopy test is all about.

Have students work in pairs to read the three handouts **What is Colorectal Cancer? Who is Likely to Get Colorectal Cancer?**[1] and **Colonoscopy**. Students should then answer the **Colorectal Cancer Reading Comprehension Questions**. Circulate among pairs while they are working and bring the class back together to review answers to the questions.

Remember, as an ABE teacher, you are not a medical expert, so technical questions should be referred to a health professional!

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[1] These materials are adapted from the Healthy Roads Media Web site at
http://www.healthyroadsmedia.org/eng.htm.

Colorectal Cancer Reading Comprehension Questions
(Teacher's Answer Key)

I. Read the page titled, "What is Colorectal Cancer?" and answer the following questions.
1. Digestive system
2. Tumor or polyp
3. Blood in or on stools; alternating between constipation and diarrhea; very thin or narrow stools; feeling bloated or gassy; stomach pains; vomiting; losing weight without trying; feeling tired all the time.
4. Eat fruits and vegetables every day; exercise

True or False

1. False (stomach and small intestine)
2. True
3. False
4. False
5. True

II. Read the pages titled, "Who is Likely to Get Colorectal Cancer?" and "Colonoscopy," and answer the following questions.

1. More than 55,000
2. Being 50 or older; having (or having family members who have had) polyps or colorectal cancer before; having chronic inflammation of the colon, such as Crohn's disease or ulcerative colitis
3. Take a daily vitamin with folic acid or folate; eat less red meat (2-3 serving per week); eat deep-fried foods less often; eat less fatty foods; quit smoking; don't drink a lot of alcohol.

True or False

1. False
2. True
3. False
4. False

3. **The Big Decision Game (Large group activity**) In this part of the lesson, students take on roles to explore the process of making a decision such as whether or not to have a colonoscopy.

    Preparation

    To begin, explain the three different roles available to students, and ask each student to choose a role to play during this activity.

    ▪ Three people make up the team of ***decision-makers.***

        Explain that the job of this group is to make a decision about William's colonoscopy. As the "game" moves along, they will hear pieces of information from the different kinds of influences that affect this kind of decision. Every time the team hears new information, they will have 30 seconds to keep or change their decision.

    ▪ Five people act as ***influences.***
        1 = personal views, beliefs, phobias, etc.
        2 = family, friends, community
        3 = money
        4 = work
        5 = health information/doctors

        Explain that this group will serve as the voices of some of the influences that can affect this kind of decision. Each person should write down the name of their influence to hold up, so others know who they are (personal views, money, work, etc). Each person will also be given examples of things that he or she can say from this perspective. (See the **Big Game Materials Influence Statements** on page 21 of this lesson.) You can also invite students to ad-lib, as long as what they say represents their assigned influence.

    ▪ The rest of the class serves as ***observers and voters.***

        Explain that this group will listen to the influences and observe the decision making of the decision-makers. This group should pay careful attention to the reasons behind the team's decisions at each step. They will be asked to vote on the decision and share their observations and comments at the end of the game.

    To Play the Game

    1. First the decision team must make an initial decision (not final) based only on hearing the question. The three people vote; the majority wins. The teacher or a volunteer records the answer on the board or an overhead for all to see.

2. Next, one of the influences reads a card with a statement on it. For example:
    Personal Views says: "I hate doctors, needles and anything that has to do with a
    hospital."

3. The decision team then has 30 seconds to revise its decision or keep as is and
    indicate why.

4. While the team is deliberating, the teacher polls the observers for a decision and
    records their answer in a separate column on the board. Running records are made
    of the decisions. (2 lists – 1- team and 1- observers). The teacher then compares
    the decisions.

5. Next, another influence speaks. For example: Money says "My insurance only
    covers part of the cost of the test. I'll still have to pay $100."

6. Again the team is asked to make a decision and indicate why, and the teacher
    polls the observers and compares answers.

7. The same process continues until all influences have spoken at least twice. Then
    influences and observers are offered the opportunity to add additional influences
    or elements to the decision making process. "Would anyone like to add
    something that our team should think about in making this decision?"

8. When no more influences or ideas are offered, the team must make its final
    decision. It has no more than 2 minutes for this. During that time, the observers
    are polled for their final decision. When time's up, the team announces its
    decision.

Sharing Observations and Comments

Once the team has offered its decision, ask observers the following questions:

> *What did you notice about how the team made its decision over time?*
> e.g., They never wavered, they changed a lot, etc.

> *What appeared to be the strongest influences on their decision?*
> e.g, They seemed very concerned with money, or how the decision
> affected their family, etc.

Ask the whole class the following questions:
> *Let's look at the observers' decision making. What do you notice about their
> decision-making route? Was it similar or different? How?*
> *How might you draw the two decision-making paths?*

Ask for volunteers to draw the decision making paths on the board or overhead.

As a way to review the activities of the day, ask the students to generate the following lists (bolded column headings). Record their answers in a table like the one below on the board or an overhead.

Making Big Decisions

Influences on decision	*What makes decision hard*	*What helps with decision*	*Sources of information*
Personal views Family, friends, community Money Work Health information/ doctors [Add others generated from student discussions]	*e.g., Time pressures Worries Costs Consequences*	*e.g., Information Time and space to think*	*e.g., People Doctors Web magazines*

4. **Homework Assignment: Use the Ottawa Personal Decision Guide**[2] Distribute the Ottawa Personal Decision Guide (found at the end of the lesson plan handouts) to each student. Explain that this is one tool for people to use when they are facing a difficult decision about health or other areas of life.

Point out that the guide is based on five key steps in the decision making process:

> 1) Clarify the decision.
> 2) Identify your role in decision-making.
> 3) Assess your decision-making needs.
> 4) Weigh the options.
> 5) Plan the next steps.

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[2] This guide was developed by the University of Ottawa, Ottawa Health Research Institute. It is available on-line at http://decisionaid.ohri.ca/decguide.html.

The guide allows a person to go through the decision-making process two times, since sometimes new information becomes available, or our thoughts change over time – as students probably observed during the big decision game.

Ask students to read over the **Decision Guide** for homework. As they read, ask students to think about the following questions:

What would you find helpful about using this tool?
What would make it difficult to use?
How does this way of making a decision compare to your own way of making big decisions?

Session 2

1. **Introduction** Review the activities of the previous session, in which students learned about the colonoscopy test and played the Big Decision Game. Ask students to comment briefly on their impressions of the Ottawa Personal Decision Guide.

2. **Practice Using the Decision Guide (Pairwork)** Have students work in pairs for about 25 minutes. Distribute one new copy of the decision guide to each pair. (Students can keep the clean copy distributed for homework for their own future reference.) Explain that in each pair, one student will play the role of the "decision maker" around a current, imagined, or past decision. The other student will be the "decision coach." The coach will interview the decision maker, using the Decision Guide. Together, the pair should complete one copy of the guide (as much as possible).

   When all pairs have finished, ask for volunteers to answer the questions:

   > *What was most useful about this guide?*
   > *What was most difficult about using it?*
   > *How well does this guide match with how you make decisions?*

   Point out that you hope that the guide– or some parts of it – will be helpful to students the next time they face a big decision.

3. **Writing Activity (Individual practice)** Ask students to think of a time when they faced a big personal decision. Distribute the handout *Essay: My Big Decision* and review the questions with all students. Have students begin to draft their essay. Follow through to completion using your usual essay-writing procedures.

Note to teacher: This writing assignment may be done in class or as homework.

Follow-up Activities

A. Invite a guest speaker. Ask a health professional from the program's community to visit your class to talk about colorectal cancer and other types of screenings. Have students prepare a list of questions in advance in preparation for this meeting.

B. Draw decision paths. Ask students to think about a big decision they once made that are willing to share with the class. Have students make a drawing that represents their path to the decision. For instance, was their path to a decision a straight line or was it a winding road? Have students present their drawings to the class.

Technology Tips

1. Audio presentation of information

✓ *Healthy Roads Media*
http://www.healthyroadsmedia.org/
The Healthy Roads website offers audio versions of much of its health information. If you have access to a computer lab, you may want to have your students go to the website and listen to the audio presentation on colorectal cancer and other health topics.

2. More information on colonoscopy

✓ *WebMDHealth: Health Guide A-Z*
http://my.webmd.com/hw/colorectal_cancer/hw209694.asp
This site offers more information on the colonoscopy test. It includes diagrams of the large intestine, as well as a person having the procedure done, and provides more detail on the actual procedure, including how to prepare, how it feels, risks, and results.

✓ *National Digestive Diseases Information Clearinghouse: Colonoscopy*
http://digestive.niddk.nih.gov/ddiseases/pubs/colonoscopy/
This site offers an explanation of a colonoscopy, including risks and preparation. It also provides a diagram of the digestive system.
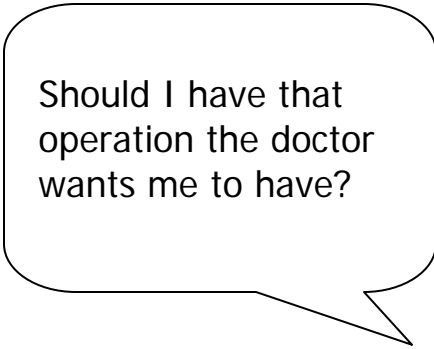
3. Medical test information form
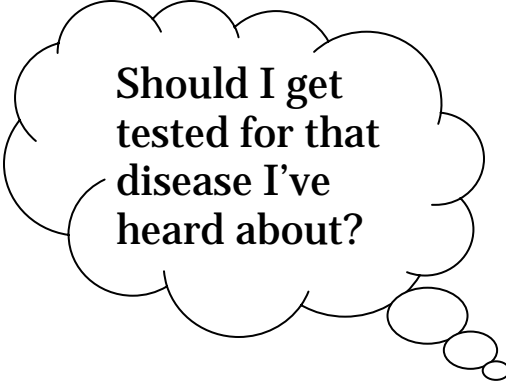
✓ *WebMDHealth: Health Guide A-Z*
http://my.webmd.com/hw/colorectal_cancer/hw209694.asp
The Medical Test Information Form can be accessed through a link within the WebMD website on Colonoscopy, in the "How to Prepare" section.   The form can be used by patients use to gather information about medical tests. It includes questions on the purpose of the test, what might happen if the test is not done, risks associated with the test, how it will feel to have the test done, and more.

Decisions, Decisions!

Should I have that operation the doctor wants me to have?

Should I get tested for that disease I've heard about?

Should we buy a house instead of renting?

Should we move the family to Florida?

What Is Colorectal Cancer?[3]

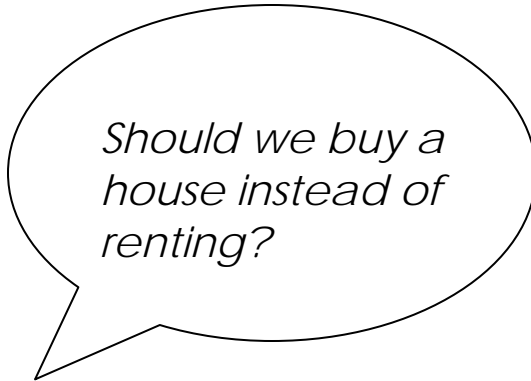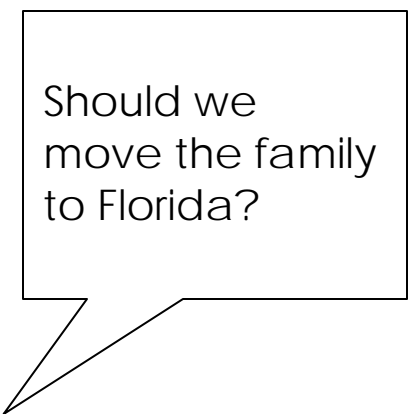Colorectal cancer is often called <u>colon cancer</u>. It is a common health problem in the United States. It kills more people than any other type of cancer except lung cancer. More than 55,000 Americans die from colorectal cancer each year.

Colorectal cancer affects the <u>large intestine</u>, which is part of the body's digestive system. The digestive system breaks down food so your body can use it for energy. After you eat a meal, your stomach starts to break down the swallowed food. The broken-down bits of food go into the small intestine where they're broken down even further. The small intestine also absorbs nutrients into your bloodstream from the broken- down food. The material that remains goes into the first part of the large intestine (<u>colon</u>), where water is removed and it becomes more solid. It then goes into the part of the large intestine called the <u>rectum</u>, and passes out of your body as stool (also called bowel movements or feces).

Colorectal cancer is a problem with cells in the large intestine. Cells are the very small units that make up all living things, including the human body. They are so small, you need a microscope to see them. There are billions of cells in each person's body. Normally, cells grow and divide and know when to stop growing. Sometimes, things go wrong and cells just continue to grow and divide out of control. These uncontrolled cells can clump together to form a growth that sticks out into the large intestine. This growth is known as a <u>polyp</u>, or a <u>benign tumor</u>. A polyp itself is not cancerous at first, but it can eventually become cancerous.

Colorectal polyps are common in people over age 50. About 4 out of 10 people over age 50 have them. Some polyps become cancerous. When a polyp becomes cancerous, it is also known as a <u>malignant tumor</u>. This means that cells from the polyp can destroy the healthy tissue around the polyp and can invade other body parts. This can be dangerous and difficult to treat.

Fortunately, most polyps are not cancer. A non-cancerous polyp

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[3] Adapted from *What is Colorectal Cancer?* Available at www.healthyroadsmedia.org

may grow to a large size, but it will not spread to other body parts. A small number of polyps (5 to 10 percent) will become cancer if they are not removed early. But, doctors cannot tell which polyps will become cancer. So to be safe and prevent colorectal cancer, it is better to find and remove all polyps.

Usually, polyps and early colorectal cancer don't cause any noticeable changes in your body. Later, as colorectal cancer grows, people may notice some problems, or symptoms, like:

- Blood in or on your stools
- Going back and forth between hard stool (constipation) and loose stools (diarrhea)
- Very thin or narrow stools
- Feeling bloated or gassy
- Stomach pains
- Vomiting
- Losing weight without trying
- Feeling tired all the time

These problems or symptoms may be caused by colorectal cancer or other problems. Check with a doctor if you notice any of them.

Without symptoms, the only way to find polyps or colorectal cancer is to be tested. If polyps are found, they are usually removed. If the polyps are discovered to be cancerous, then the treatment may also include radiation, chemotherapy or other medicines. Cancer is not contagious. You cannot catch it from someone who has it.

Talk to your doctor about the tests that find polyps early. When they are found early, they are easier to treat. Things you can do to prevent colorectal cancer are eating fruits and vegetables every day and exercising often.

Who Is Likely to Get Colorectal Cancer?[4]

Colorectal cancer occurs more frequently in industrialized, Western societies. It kills more than 55,000 Americans each year. Both men and women can get colorectal cancer. It is most common in people who are 50 years old or older. Doctors do not know exactly what causes colorectal cancer. However, there are some things that increase your risk of developing it.

Your risk increases if:
- You are 50 years old or older.
- You or a family member had colorectal polyps or cancer before.
- You have chronic inflammation of the colon, such as ulcerative colitis or Crohn's disease.
- Your diet is high in fat.
- Your diet is low in fruits and vegetables.
- You eat a lot of red meat, especially if it's grilled, fried or barbequed. ("Red" describes the type of animal meat, not whether it is rare or cooked. This includes lamb, pork and beef.)
- You smoke cigarettes.
- You drink a lot of alcohol.
- You don't exercise and you are overweight.

What Can You Do to Prevent Colorectal Cancer?

The most important thing you can do is to be screened for it on a regular basis when you are 50 years old and older. Be tested at a younger age if you or a family member have or had colorectal polyps or cancer before; colon diseases, such as ulcerative colitis or Crohn's disease, or a hereditary disease that increases

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[4] Adapted from *Who is Likely to Get Colorectal Cancer?* Available at www.healthyroadsmedia.org

your family's risk for certain kinds of cancer. Ask your doctor at what age you need to be tested and which test is best for you.

People of all ages can do things to help prevent polyps and colorectal cancer:

- Take a daily multivitamin with "folic acid" or "folate, " a "B" vitamin that is found naturally in fruit, vegetable, and rice.
- Exercise. Try getting at least 30 minutes of physical activity everyday.
- Eat less red meat, just 2-3 servings per week.
- Eat 5 or more servings of fruits and vegetables a day.
- Eat deep fried food less often, and eat fewer fatty foods.
- Quit smoking.
- Don't drink a lot of alcohol.

Doing things to prevent colorectal cancer can protect you and your family against other diseases, too, like heart disease and diabetes.   Follow your doctor's recommendations for staying healthy!

Colonoscopy [5]

Colonoscopy is one type of screening test that doctors use to look for colorectal cancer. There are a number of different screening tests that can be used to screen for colorectal cancer, and a doctor may suggest one of the others based on your situation and the risk factors that you may have. Doctors usually recommend that people aged 50 and over have screening tests for colorectal cancer. Colonoscopy allows a doctor to look directly inside your large intestine to examine the entire colon. The doctor inserts a thin, flexible tube through the rectum into the colon. A tiny camera at the end of the tube lets the doctor see inside. If you have a polyp, the doctor will probably remove it during the colonoscopy.   If the polyp cannot be completely removed, the doctor may take a sample piece (called a "biopsy") of it to be more closely examined in a lab.

To prepare for the colonoscopy, you have to clean out your colon. This can include following a special diet and using medication that helps to empty the colon. This usually takes 1 or 2 days. Doctors often suggest that you stay home during this time since you will have to use the bathroom a lot.

Right before the colonoscopy, you receive medication to help you relax. After the test, you cannot drive yourself home, so you will need someone to drive you home.

There is a small chance of having a serious complication or problem from the colonoscopy test. There are other tests that look at your intestine, but the colonoscopy is the most thorough. When you have a colonoscopy test done, you don't need to have any other tests to look for polyps or colorectal cancer.

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[5] Adapted from *5 Tests to Find Polyps and Colorectal Cancer*. Available at the Healthy Roads Media website: http://www.healthyroadsmedia.org/eng.htm

Colorectal Cancer Reading Comprehension Questions

I. Read the page titled "What is Colorectal Cancer?" and answer the following questions.

1. The colon is part of what system of the human body?

   _____

2. What do doctors call the thing created by the growth of uncontrolled cells?

   _____

3. What are four problems that might mean someone has colorectal cancer?

   _____

   _____

   _____

   _____

4. What are two things that you can do to help prevent colorectal cancer?

   _____

   _____

True or False?

1. The colon is the part of the body where food is broken down.	**T**	**F**
2. Polyps are common in people over 50.	**T**	**F**
3. Everyone who has a polyp has cancer.	**T**	**F**
4. Colorectal cancer is contagious.	**T**	**F**
5. The best way to keep polyps from turning into cancer is to have a doctor find and remove them.	**T**	**F**

II. Read the pages titled, "Who is Likely to Get Colorectal Cancer?" and "Colonoscopy," and answer the following questions.

1. Approximately how many people die each year from colon cancer?

    _____

2. What are three things that increase a person's risk of getting colorectal cancer?

    _____

    _____

    _____

3. Besides the two things you listed earlier in question 5, what are three other things you can do to reduce your risk of colorectal cancer?

    _____

    _____

    _____

True or False?

1. Only men can get colorectal cancer.   **T**   **F**

2. You are at higher risk for colorectal cancer
    if someone in your family had colorectal cancer.   **T**   **F**

3. If you have a colonoscopy, you will still need
    other tests to find polyps or colorectal cancer.   **T**   **F**

4. You can tell if you have colorectal cancer
    without seeing a doctor.   **T**   **F**

Big Decision Game Materials
Influence Statements

Cut out each of the boxes provided below. Distribute a box to each student who will play the role of an influence in the Big Decision Game.   Remind students that they can make up their own statements, as long they represent the perspective of the influence that they are assigned.

Personal Views

If you are playing this role, you might say the following:

I hate needles and all that stuff doctors use, and I don't want anyone poking around in my behind!

What if I find out I do have cancer? I'm not sure I could handle it.

When you have a colonoscopy done, there is a risk of getting severe bleeding or a tiny hole in your colon. They say there's about a 1 in 1,000 chance of that happening – what if I'm the one in a thousand?

Family, Friends, Community

If you are playing this role, you might say the following:

My father's doctor thinks colon cancer is what killed my dad.

My wife keeps telling me that I should have this test done so she won't worry about me.

I want to be around to see my kids grow up.

Money

If you are playing this role, you might say the following:

If I have this test done, it's going to cost me $200, even with my health insurance.

If I get sick and am out of work, how will we pay the bills?

If it turns out I have cancer, how will I be able to support my family?

Work

If you are playing this role, you might say the following:

To prepare for this test, I'd have to drink only liquids for a day or two and go to the bathroom a lot to clear out my colon. That will mean I'll probably have to miss work on the day before, and the day of the test. My boss won't be happy about that.

What if I find out I've got cancer? They might fire me and then I'll lose my insurance, and my family will really be in trouble.

Health Information, Doctors

If you are playing this role, you might say the following:

Doctors think that the most important thing you can do to prevent colorectal cancer is to get tested for it on a regular basis once you turn 50.

Having someone in your family who has had cancer increases your risk of getting colorectal cancer.

A person could have early colorectal cancer and not even have any symptoms.

Essay Writing: *My Big Decision*

Think of an important decision that you once faced in your life.
Write an essay that answers the following questions:

- *What was the big decision you faced?*
- *What made this decision difficult?*
- *What were the pros and cons of each option?*
- *What was important to you in making the decision?
  (e.g., I wanted to do what was best for my children, I
  didn't want to upset anyone, etc.)*
- *What helped you make your decision?*
- *Were you happy with your final decision? Why?*

Ottawa Personal Decision Guide

For Health or Social Decisions

The Ottawa Personal Decision Guide is for people who are facing tough decisions. It will help you identify your personal needs, plan the next steps, track your progress, and communicate your views to others involved in the decision. The skills you learn here will also help you make other decisions in the future.

You will be guided through 5 steps:

1 Clarify the decision.

2 Identify your role in decision making.

3 Assess your decision making needs.

4 Weigh the options.

5 Plan the next steps.

The guide can be used more than once to track your progress in decision making. The first time you use the guide, please place your answers in the first column. The next time, please use the second column.

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1 Clarify the decision.

What is the decision you face?
_____
_____

What is your reason for making this decision?
_____

When does this decision have to be made? Date _____

How far along are you with your decision? [Check ✓ the box that applies to you].

	First Time Date: _____ (mm/dd/yy)	Changes Date: _____ (mm/dd/yy)
a. I have not yet thought about options	❑	❑
b. I am considering the options	❑	❑
c. I am close to choosing an option	❑	❑
d. I have already made a choice	❑	❑

Are you leaning toward a specific option? Yes ❑ No ❑   Yes ❑ No ❑

If yes, which one? Specify: _____ _____

2 Identify your role in decision-making. [Check ✓ the box that applies to you]

	First Time Date: _____ (mm/dd/yy)	Changes Date: _____ (mm/dd/yy)
a. I prefer to decide on my own or after considering the opinions of others.	❑	❑
b. I prefer to share the decision with: _____.	❑	❑
c. I prefer that someone else decides for me, namely: _____.	❑	❑

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Ottawa Personal Decision Guide

For Health or Social Decisions
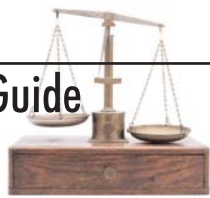
3 **Assess your decision-making needs.**

People make better decisions if they feel confident in four areas: 1. knowing the options; 2. feeling clear about what is important to them; 3. having enough help from others in deciding; and 4. feeling sure that they are making the best choice.

The questions below can help you see how confident you are in the four areas. Please circle your answers to the questions and date each column.

Areas		First Time Date _____ mm/dd/yy		Changes Date _____ mm/dd/yy	
What I know	Do you know which options you have?	Yes	No	Yes	No
	Do you know the good and bad points of each option?	Yes	No	Yes	No
What's important to me	Are you clear about which good and bad points are most important to you?	Yes	No	Yes	No
How others help	Do you have enough support from others to make a choice?	Yes	No	Yes	No
	Are you choosing without pressure from others?	Yes	No	Yes	No
How sure I feel	Do you feel sure about the best choice for you?	Yes	No	Yes	No

Decisional Conflict Scale ©2004 A. O'Connor

If you answer 'yes' to all the questions in an area, this shows you feel confident. People who have answered 'no' to one or several questions are more likely to delay their decision, to have trouble sticking with their choice, or to feel regret about their choice or less satisfied with their decision. Therefore, it is important to work through steps **4** and **5** to gain more confidence in each area.

Ottawa Personal Decision Guide
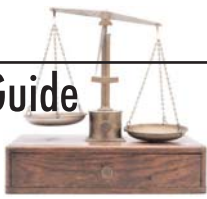
For Health or Social Decisions

4   Weigh the options.

Use the balance scale below to help you compare the options and, if you wish, show others involved in the decision.

What I Know
A. Please list and review the options you are considering on the balance scale below.
B. List the pros and cons of each option.
C. Underline the pros and cons that you think are most <u>likely</u> to happen.

What is Important to Me
D. Show how <u>important</u> each pro and con is to you by placing one star (*) to five stars (*****) beside each item. More stars show more importance.

How Sure I Feel
E. Circle the option with the pros that are most important to you and most likely to happen. Avoid the option with the cons that are most important to avoid and most likely to happen.

	☺ PROS Reasons to choose option	Personal Importance Add * to *****	☹ CONS Reasons to avoid option	Personal Importance Add * to *****
Option #1 is:				
Option #2 is:				
Option #3 is:				

Ottawa Personal Decision Guide

For Health or Social Decisions

4 **Weigh the options.** (continued)

F. 'How Others Help Me'.
Complete the table below to keep track of others involved in this decision.

List the persons whose help or opinions matter most to you	Circle their opinion on the best choice for you				Things they can do to help you in this decision
1.	Neutral	Option #1	Option#2	Option#3	
2.	Neutral	Option #1	Option#2	Option#3	
3.	Neutral	Option #1	Option#2	Option#3	

5 **Plan the next steps.**

✓ Things making the decision difficult	✓ Things you are willing to try
❑ Not enough information about options, pros and cons	Having enough information makes it easier to participate in decision making. ❑ List your questions: ❑ List the sources you will use to find this information (e.g. health professionals, librarian at a health centre, Internet, etc.):
❑ Not enough information about the likelihood of the pros and cons	People make decisions based on their perception of what might happen. ❑ Get advice from your health professional or counsellor about how likely the pros and cons are to happen in your situation.
❑ Unsure about which pros or cons are most important to me	Finding out what was most important to others who made this decision may help clarify what is important for you. ❑ Talk to your health professional or counsellor about other people who made this decision. ❑ Review stories about others who made this decision (e.g. on the Internet) Whose views match yours? ❑ Talk with people you know who have gone through this decision. Please specify who: _____
❑ Lack of support or resources	Support from other people or groups can help your decision making. ❑ List the resources or practical help you still need. ❑ Get advice from a professional you feel comfortable with. ❑ Choose a trusted person who will help you work through the decision. ❑ Bring someone with you to medical or other appointments to take notes.
❑ Pressure from others to make a specific choice	Focus on the opinions of 'people who matter' in this decision. ❑ Share your decision guide with others. ❑ Ask others to complete a guide themselves. Identify areas of agreement and differences. (People usually can agree on the facts, but may differ on what they value most. It is the person who will be most directly affected by the choice whose values matter most). ❑ Find a neutral person to help you and others find solutions to the disagreement.
❑ Other factors making the decision difficult	List anything else you need to help you:

Ottawa Personal
Decision Guide

For Health or Social Decisions

If you would like to share this information with your health practitioner or other health professional, please complete this section with some information about yourself.

Current Date: _____
                        dd/mm/yy

Last Name: _____ First Name : _____

Year of birth: _____

Sex: ❏   male   ❏   female

Highest completed education:
            ❏   grade school
            ❏   elementry school
            ❏   some high school
            ❏   high school diploma
            ❏   community college diploma
            ❏   university degree

Language most often spoken
at home: _____

Ethnic origin: _____ (e.g. Caucasian, Asian, African, Hispanic)

Medical conditions
that might affect your
decision: _____

Please rate your health:
            ❏   excellent
            ❏   good
            ❏   fair
            ❏   poor

Family composition
(Who lives at home with you?) _____

Address : _____
          _____

Telephone number: (_____) _____

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Discuss your options and views with your health professional or counsellor.

Before making a final decision, discuss your situation with your health professional or counsellor. Every individual's needs and health concerns are different.

For additional copies of this decision aid and an interactive version, visit www.ohri.ca/decisionaid

Lesson 9: (ESOL) Introduction to Informed Consent

Prevention and Screening Tasks Addressed in This Lesson
- Become familiar with the nature and purpose of informed consent forms
- Get help to understand information on official forms and documents

Skills Focus
- Students will share and discuss personal perspectives on official documents and forms used in everyday life.
- Students will learn vocabulary typically found on informed consent forms.
- Students will strengthen oral communication skills needed to ask questions and request help when they want more information from their doctors about tests and procedures.

ESOL Level
Intermediate to advanced

Time
Approximately 4 hours
(or 2-3 class sessions)

Materials
Student handout

Key Vocabulary

benefits	patient rights
capacity	risks
coercion	test
duress	treatment
grant	voluntarily
informed consent	

Purpose
This lesson is designed to introduce ESOL students to the nature and purposes of informed consent forms in health care. The lesson is organized around four readings, which describe the concept and purpose of informed consent forms. After each reading, students complete an exercise that either reinforces new vocabulary or provides them with an opportunity to talk about the nature of informed consent.

Steps

Prepare for the lesson. Copy and distribute the Introduction to Informed Consent handout (Parts A and B). Teaching notes for each part are provided below.

PART A: Introduction to Informed Consent

1. **Pair Work**
   Ask the students to find a partner to complete Part A on the handout. As the directions on the handout indicate, the pairs are asked to look over the list of official documents and forms in the chart and check which ones they know about and which ones they have actually signed before. This pair work provides students with an opportunity to share their experiences with official forms and documents and to identify barriers to understanding these forms. When pairs have finished, invite 1-2 students to share their experiences with forms and documents.

PART B: Introduction to Informed Consent

1. **Reading #1**
    Say to the students, "We have just talked about lots of different kinds of official documents and forms. Now we are going to focus on one kind of form that doctors often use. It is called an informed consent form."

    Write "informed consent form" on the board. Say to the students, "Do not worry if you do not know what this means. We will now read something that will teach you about informed consent. Let's begin." Tell the students to look at Reading #1 in Part B.

    You can do a model reading of Reading #1. Next, ask for a volunteer to read the text again. Then, ask the students to explain to a partner what the passage is about. This retelling can be useful for students who need the opportunity to practice new vocabulary and build self-confidence in reading fluently. Once students have a working idea of what the reading is about, you may wish to practice reading the text in different ways: choral reading (reading the text aloud together); echo reading (the teacher reads a line and all the students repeat the line back to the teacher); peer reading (students work in pairs to take turns reading the text).

2. **Vocabulary Study**
    This exercise is meant to reinforce the students' comprehension of the new vocabulary words learned in Part A. The students are asked to look closely at the words *informed* and *consent* and to think of words that are related in form and meaning. This exercise builds the students' knowledge base and taps into any prior knowledge they may have of these words.

    Note also that students may be able to identify cognates for the words *informed* and *consent* in their first language. (Cognates are words in two languages that have a common ancestral origin and thus are similar in spelling and/or meaning. *Inform* in Spanish is *informar; consent* in Spanish is *consentimiento*). To strengthen students' vocabulary knowledge, invite students to share any cognates of these new words with the class.

3. **Check Your Understanding**
    An important step after Reading #1 is asking students to define *in their own words* what they think informed consent means. This step provides you (the teacher) with an important comprehension check. It also will be useful for students who need practice using new vocabulary. If appropriate, you may wish to encourage students from similar first-language backgrounds to work together at this point so that they can utilize their first language to confirm and clarify their understanding.

    Note to teacher: Reading #1 contains the words "risks" and "benefits," words that may be unfamiliar to students. Understanding these words is important if the students are to fully appreciate the meaning of "informed consent." Be sure to check the

students' comprehension of these words before going on to Reading #2.

4. **Reading #2 and Discussion**
   You (the teacher) can do a model reading of Reading #2. As with Reading #1, ask for a volunteer to read the text again. Then ask the students to explain to a partner what the passage is about. Practice reading the text in a way that suits your class: e.g., choral reading (reading the text aloud together); echo reading (the teacher reads a line and all the students repeat the line back to the teacher); peer reading (students work in pairs to take turns reading the text).

   Be sure that in your model readings of Reading #2, you emphasize the words "the moral and legal right to make decisions," because these words are the focus of the discussion immediately following Reading #2. The students are asked to say what they think the phrase "the moral and legal right to make decisions" means. To guide discussion, ask students, "What is a moral right? What is legal right? Why is informed consent a moral and legal right?"

   Note: A legal right is a right that is protected by the law of the government. A moral right is a right that people believe all humans should have. Moral rights are not protected by the law. People do not always agree on what is a moral right.

   The students are asked to complete a sentence prompt that makes use of the phrase "moral and legal right." This task is meant to reinforce their understanding of these important words.

   Ask for volunteers to share their completed sentences with the rest of the class.

5. **Reading #3, Vocabulary Study, and Discussion**
   Again, as with previous readings, you (the teacher) can do a model reading of Reading #3. Ask for a volunteer to read the text again. Then ask the students to explain to a partner what the passage is about. Practice reading the text in a way that suits your class: e.g., choral reading, echo reading, or peer reading, as described above.

   After the students finish reading Reading #3, they focus on some legal words commonly used on informed consent forms. The chart, which compares **Legal Talk versus Everyday Talk,** shows the students how the legal words can be "translated" into everyday words. The vocabulary focus and accompanying discussion questions help students think critically about the language used on medical consent forms. This critical look at language can help students talk about how the language of the medical world is a barrier to health care. Students have the opportunity to talk about issues of language and power. For example, the students may want to talk about the underlying assumptions – the "unspoken" messages – about who is in control of health care decisions. Lawyers and doctors may have more control because they decide what information to put on these forms, and patients may not feel in control if they cannot understand the information that is given to them. From this kind of discussion,

students are then given an opportunity to identify coping strategies – action steps they might take if they didn't understand a word on an informed consent form (e.g., ask for a trained interpreter, ask the doctor a lot of questions).

6. **Reading #4 and Discussion.**
   As with previous readings, you (the teacher) can do a model reading of Reading #4 Ask for a volunteer to read the text again. Then, ask the students to explain to a partner what the passage is about. Practice reading the text in a way that suits your class.

   Allow 20 minutes for partners to discuss the questions that follow the reading. These questions are meant to check students' comprehension of two main ideas from Reading #4. One, students should understand that asking questions of your doctor about tests and treatment is important; asking questions *before* you have a test or treatment is the best time to ask questions. Remind students: if you don't ask questions, your doctor may think you understand. Two, students should understand that you can still ask questions after you sign a consent form. You can also change your mind about a test or treatment even if you have signed a form. Signing the form does not mean you HAVE to have a test or treatment.

Follow-up Activities

A. **Personal "health care dictionaries."** The creation of a vocabulary log can be carried out individually or in small groups. Students are asked to create their own "dictionaries" for studying the new vocabulary presented in the readings on informed consent. The dictionaries can include key words chosen by the instructor as well as words that the students want to remember. Encourage the students to include first language translations, pictures, and sample sentences for each entry. This project can be used to launch the creation of personal "health care dictionaries," where students can record any new words related to health care that come up in class. Students can use their dictionaries for self-study or exchange dictionaries with a partner to learn more new words.

B. **Looking at informed consent forms.** Gather sample informed consent forms from hospitals and doctors' offices. Students can also ask their doctors for sample informed consent forms. In class, form small groups to look at the consent forms. Ask the students: Are these forms clear? What is easy to understand? What is difficult to understand? Are these forms written in other languages besides English? What should doctors do to make these forms clearer and easier to read?

C. **Role-play.** Tell the students: "You are a patient. Your doctor gives you an informed consent form. You do not understand what the form is about. What can you ask the doctor?" Write a short skit between the patient and the doctor. Practice your skit. Perform your skit for the whole class.

D. Guest speaker series. Invite a doctor and/or a medical lawyer to talk to the class about informed consent forms. Students can work together to write a letter of invitation to a particular doctor, local clinic, or legal office inviting someone to come speak to their class. Students can prepare questions in advance. After a guest speaker event, students can summarize what they learned and share their notes with other students in the adult education program.

E. Multilingual resource guide on informed consent. Students can create a resource guide on informed consent forms to share with other adult ESOL students. The guide can explain in English and in their first language what informed consent forms are, why they are important in health care, and what patients can do if they do not understand information their doctors give them.

Adaptations for ABE/GED settings

Our advanced ESL as well as native-English speaking students are also likely to experience difficulties understanding and reading informed consent forms. To make the lesson more challenging for more advanced students, you may wish to assign two of the four reading texts at a time and ask the students to write a written response as well as discuss the readings in small groups. Ask students to choose 5-6 words they really want to remember from these readings. In pairs, students can work together to create a lesson activity that teaches the words to the rest of the class. Encourage the students to use visual props (e.g., transparencies that can be displayed on an overhead projector). Challenge the students to come up with creative ways to teach the words to their peers. Some possible activities the students might use include: role plays and skits, games, crossword puzzles, vocabulary quizzes, use of songs, or picture prompts.

Technology Tips

✓ **National Cancer Institute, A Guide to Understanding Informed Consent**
   http://www.cancer.gov/clinicaltrials/conducting/informed-consent-guide/
   This lesson drew information about informed consent from this useful website. The website is designed for researchers and doctors but features information (e.g., myths and realities about the nature of informed consent) that practitioners may find useful for creating lesson materials or for background information.

✓ **eMedicineHealth.com, Patient Rights: Informed Consent**
   http://www.emedicinehealth.com/articles/12033-3.asp
   This lesson also drew information about informed consent from this website that is more reader-friendly than the NCI site listed above.

INTRODUCTION TO INFORMED CONSENT

A. Pair Work.

Look at the chart below. Have you seen these documents or forms before?

Which ones do you know about? Which ones have you read and signed before? Check ☑ the appropriate boxes.

Find a partner and talk about your answers.

Add other official documents and forms that you and your partner know about.

Document or form	I know about this one.	I have read and signed one before.
School permission form	☐	☐
Employment contract	☐	☐
Lease agreement	☐	☐
Informed consent form	☐	☐
	☐	☐
	☐	☐

Have you ever had problems reading official documents and forms? What happened? What did you do?

Share your answers with your partner.

B. Read and study. Focus on "informed consent" in health care.

Reading #1.

Please read the text in the box below.

In the United States, doctors must give you, as a patient, information about a particular treatment or test so that you can decide whether or not to have the treatment or test. This process of understanding the risks and benefits of a treatment or test is known as informed consent. When you sign an informed consent form, you are telling the doctor that you understand the information about a treatment or test.

Vocabulary Study. You can learn words by learning other words that have similar form and meaning (sometimes called derivatives). For example, let's look at the words "informed consent". What does "to inform" mean?

Some common derivatives of inform are *information, informed, informative*, and *informant*. Some derivatives of consent are *consensus* and *consensual*. These words are different parts of speech but share common meanings.

Study these words in the chart on the next page. Write down their meanings.

Part of speech	Word	Meaning
Noun	information	
	informant	
	consensus	
Adjective	informative	
	informed	
	consensual	
Verb	inform	

Check your understanding. In your own words, explain what informed consent is.

Reading #2.

Please read the text in the box below.

The process of informed consent is very important to your health care because you, as the patient, have the moral and legal right to make decisions about your own health and medical conditions.

Talk with a partner.

This paragraph says, "You, as the patient, have the moral and legal right to make decisions about your own health and medical conditions."

What does this sentence mean to you? Do you agree with this sentence? Explain.

Complete the sentence below with your own idea.

In today's society, I think that people have the moral and legal right to

_____

Reading #3.

Please read the text in the box below.

There are four key parts of an informed consent process:

1. You must have the capacity to make the decision. This means you must be able to make the decision.

2. The doctor must give you information about the treatment or test. The doctor must tell you about the possible benefits and risks, and the likelihood that the benefits and risks will happen.

3. You must be able to comprehend the information the doctor gives you.

4. You must voluntarily grant consent. This means that you have the right to make your own decision about the treatment or test. No one can force you to make a certain choice (this is coercion). No one can threaten you to make a certain choice (this is duress). These actions are against the law.

Vocabulary Study: Legal Talk versus Everyday Talk.

When doctors and lawyers talk about informed consent, they often use words that can be hard to understand.   They may use legal words that are not used in everyday talk.

Compare these lists.

Legal Word	Everyday Word
coercion	force
duress	an unfair threat
to grant	to give
voluntarily	by choice
to consent	to agree
to inform	to tell

Talk to your partner. Why do you think everyday words are *not* used on informed consent forms?

If you didn't understand a legal word on an informed consent form, what would you do?

Reading #4.

Please read the text in the box below.

The difficult language in informed consent forms can make it very hard for a patient to understand important information about a treatment or test. Before you sign, you should ask questions about the treatment or test. After you sign, you can still ask questions. You can also change your decision. Remember: keep asking questions until you have all the information you need to make a good decision.

Talk to your partner.

1. Why is it important to ask questions of your doctor?

2. Can patients ask questions after they sign an informed consent form? Why is this important?

3. Can patients change their mind about having the test or treatment *after* they sign an informed consent form? Why is this important?

Lesson 10: (ESOL) How Likely is Likely? Vocabulary for Talking about Probability

Disease Prevention and Screening Tasks Addressed in this Lesson
- Be familiar with words that doctors often use to talk about likelihood and probability (e.g., likely, rare, certain)
- Ask doctors questions about health risks

Skills Focus
- Students will learn a range of adjectives that are used to convey likelihood and probability.
- Students will explore how words differ in the degree to which they convey the certainty of events.
- Students will explore ways that people interpret the same word differently based on context.

ABE/ESOL Level
High beginning to low-intermediate ESOL

Time
2 60-minute sessions

Materials
Handout (9 pages)

Key Vocabulary

risk	certain
likely	probable
unlikely	definite
rare	fifty-fifty
impossible	improbable
possible	out of the question
equal chance	

Purpose
This lesson is designed to familiarize students with the range of words that doctors often use to convey likelihood and probability. This lesson is organized around a series of pair-work exercises. These exercises introduce students to new vocabulary (e.g., *likely, rare*) and then provide multiple activities in which to apply this vocabulary knowledge. These exercises are intended to show students that the meaning of words such as *likely* and *rare* often differ from person to person, and thus it is critical that students feel prepared to ask their doctors what these words mean in terms of individual health risks and outcomes.

Steps

1. **Preparation.** Distribute a copy of the handouts beginning with *What is likely to happen?* (pages 7-14). Organize the students into pairs.

2. **Pairwork:** The handout for this lesson features 8 exercises for the pairs to complete.

   - **Exercise 1: Warm-up**
     This conversation activity asks students to talk about the activities they do in everyday life that involve likelihood and probability, e.g., playing the lottery.   This warm-up introduces the lesson's theme. Note: there is no critical need to introduce the terms *likelihood* or *probability*. To simplify the lesson's focus, it's fine to use a word such as *chance* or a phrase like *Will it happen or not?*

- **Exercise 2: Vocabulary Study**
  This section introduces a set of words that convey likelihood or probability on a scale that shows how they range in meaning from "It will never happen" to "It will definitely happen." Read the words aloud so that students can hear a model reading. Encourage students to use their dictionaries or translate the words into their first language, if necessary.

- **Exercise 3: Vocabulary Practice**
  This exercise asks the students to apply their knowledge of the new vocabulary words. The students are asked to think of things in their everyday lives that are "likely" or "rare" and so forth.

- **Exercise 4: Vocabulary Practice: Will it happen?**
  Like exercise #3, this exercise also asks the students to apply their knowledge of the new vocabulary words. Unlike the previous exercise, which used the new vocabulary words in general life contexts, this exercise uses the words in health-related contexts.   Students are asked to think about the likelihood of eight different events. Each student writes down his or her own response using one of the new vocabulary words (e.g., *likely, not likely, impossible*). Then, each student finds a partner to compare responses. This exercise encourages students to see how people differ in their perceptions of "what is likely to happen." Our decisions about "what is likely to happen" are a combination of **fact** (hard facts, cold evidence) and **feeling** (what we believe and feel might happen).

  Note to teacher: Most of the situations in exercise #4 are open to interpretation and do not have a "correct" answer. For example, in the first situation about playing the lottery, one person may feel it is *likely* that Pablo will win the lottery while another person may feel it is *impossible*. This exercise provides students with an opportunity to talk about these differences in interpretation. Situations #3 and #8, however, have correct answers.

  - About situation #3: When you flip a coin, there are only two possibilities – heads or tails, so there is an equal chance that a flip will result in heads.

  - About situation #8: Similarly, with the sex of a baby, there are only two choices, boy or girl, so there is an equal chance that it could be a girl.

- **Exercise 5: Vocabulary Study - Words with similar meanings**
  In this exercise, students learn synonyms for the words that were introduced in exercise 2. Students are asked to add these words to the scale. This provides students with an opportunity to check their understanding of the words' meanings.

- **Exercise 6: Vocabulary Study: Adverbs that go with "likely" and "unlikely"**
   This exercise teaches the students a few adverbs that are commonly used with the terms *likely* and *unlikely*. If you wish, you may want to ask students to add these phrases to the scale in Exercise 2 as well. This shows students another way to convey differences in likelihood.

- **Exercise 7: Picture Story: What does 'likely' really mean?**
   This exercise is meant to help students think about how challenging it can be to figure out what a doctor means when she/he uses words like 'likely' and 'rare.' This exercise is also meant to help students think about the kinds of questions they can ask doctors to better understand what they mean when they say "likely" or "unlikely." Ask the students to practice reading the conversation between the doctor and patient out loud. After students have had a chance to look at the picture story, they work in pairs to answer the questions at the end of the story.

   Story Overview: A man goes to see his doctor because he keeps getting headaches. The doctor does an examination and tells the man that the cause is likely stress. She also says that the cause could be a tumor but this is unlikely. However, she tells the man that she wants to do more tests just to make sure. The man says okay and goes home. At home he starts to think about what the doctor said. He did not understand what the doctor meant by 'likely' and 'unlikely." He is confused. He is afraid that he may have a tumor.

   Here are some discussion prompts for beginning-level students who may need help comprehending the story:

   Frame 1: What is the man saying? What is he feeling? Who is he speaking to? Where are they? (Follow up: What is the doctor doing?)

   Frame 2: What is the doctor saying? What will the doctor do next?

   Frame 3: When is this happening? Why is the man in different clothes? What is the doctor saying? What is the man doing?

   Frame 4: Now, what is the doctor saying? What is the man thinking? What is he feeling? Why? (Follow-up: Has a doctor ever told you something about your health that made you worried or scared? What did you do?)

   Frame 5: What is the doctor saying? What does the man say? What do you think the man is thinking? What do you think he is feeling? Why?

   Frame 6: Where is the man now? What is he saying? What do you think he is feeling?

After discussing Frame 6, emphasize to the students that it is not always clear what doctors mean when they say "likely," "unlikely," or other related words. In fact, one study (Bryant & Norman, 1980) asked a group of doctors to say what "likely" meant in terms of numbers. They gave a range of anywhere between 40% and 75%!

Be sure that students understand the basic plot of the story before they answer the following discussion questions, which follow the story.

1. What happens in this story? Use your own words and tell the story to your partner.

2. What is the man thinking when he goes home after the exam? What do you think he is feeling? Why?

3. If this man were your friend, what would you tell him?

4. Has this experience ever happened to you? What did you do?

5. What kinds of questions can we ask a doctor if she or he talks about a health problem that is likely or unlikely to happen?

- **Exercise 8: Understanding information about health risks**
  This exercise provides an additional context for students to practice using the probability vocabulary. The teacher can organize the students into pairs or small groups to focus on one of the 3 tasks in Exercise 8. In pairs or small groups, students look at the pictures or graphs and fill in the blanks in the sentences that describe the pictures/graphs. The teacher can then facilitate a large group discussion in which each pair/small groups shares their answers. The teacher can also invite students to talk about whether the picture/graph made it easy to understand the message about risk. Also, note that the jar of marbles, the bar graph, and the line graph are common ways that doctors and health officials convey risk information to the public, so this exercise provides the students with an opportunity to develop important document literacy skills as well.

Follow-up Activities

A. **Short reading with journal writing.** Ask students to read "How likely is likely?" (found on page 15 of the student handouts) for homework or in class. This reading is about the lack of clarity around probability words such as "likely" and "unlikely," a topic that was addressed in the picture story in exercise 8. You may wish to assign this reading for homework or for in-class reading, and then discuss the questions as a whole class. You may also wish to ask the students to spend some time responding to the discussion questions in their journals.

B. **Interview practice.** Ask students to show the picture story used in this lesson to one person outside class (a family member, a friend, co-worker). The student will then interview the person about what he/she thinks is going on in the story, using similar prompts to those used in the lesson. Students can ask the following questions (or make up their own):

1. What is the man thinking when he goes home after the exam? What do you think he is feeling? Why?

2. If this man were your friend, what would you say to him?

3. Has this experience ever happened to you? What did you do?

Ask students to share their interview responses in class. As a group, talk about similarities and differences in peoples' responses.

Technology Tips

✓ The picture story in this lesson is based on work by Kate Singleton, who has created a series of pictures stories for use in the adult ESL classroom. A link to Singleton's work can be found at Web site noted below:

Singleton, K. (2002*). Picture Stories for Adult ESL Health Literacy*. Article and lesson materials available at the home page for the Center for Adult English Language Acquisition, http://www.cal.org/caela/ (Accessed April 3, 2006)

✓ Does your class want to talk more about the pros and cons of playing the lottery? Here is a link to an interesting feature produced by PBS and the television program *Frontline*. The link focuses on the California Lottery and is found at http://www.pbs.org/wgbh/pages/frontline/shows/gamble/odds/california.html (Accessed April 3, 2006)

References
Information in the following sources was adapted for use in this lesson:

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- Cohn, L.D., Schydlower, M., Foley, J., & Copeland, R.L. (1995). Adolescents' misinterpretation of health risk probability expressions. *Pediatrics, 95,* 713-716.

- Lipkus, I.M., & Hollands, J.G. (1999). The visual communication of risk. *Journal of the National Cancer Institute*, *25*, 149-63.

- McCarthy, M. & O'Dell, F. (1994). *English vocabulary in use*. Cambridge, UK:

Cambridge University Press. [Lesson 60 on Obligation, need, possibility, and probability]

- Redman, S. (1997). *English vocabulary in use: Pre-intermediate and intermediate.* Cambridge, UK: Cambridge University Press.[Lesson 32: Adverbs, frequency and degree]

What is likely to happen?

❶ **Warm up.** Look at the activities below. Circle the activities that you like to do.

play the lottery   *play poker*

read fortune cookies   *read horoscopes*

*invest in the stock   *bet on sports teams*
market*

Talk to a partner.

Ask questions about your partner's choices. For example, *Why do you like to play the lottery?*

❷ **Vocabulary Study.**   The picture below shows a scale with words that you can use to talk about how likely it is that something will happen. Practice saying these words. Use a dictionary if you need help with their meanings.

"It will never happen."						"It will definitely happen."
impossible	rare	unlikely	equal chance	possible	likely	certain
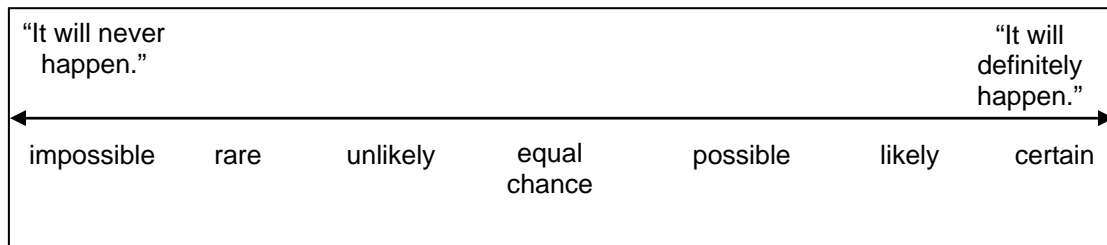
❸ **Vocabulary Practice.** Think of something in today's world that...

- is certain to happen.
- is likely to happen.
- is possible.
- has an equal chance of happening.
- is unlikely to happen.
- is rare.
- is impossible.

Share your ideas with others in your class.

❹ **Vocabulary Practice: Will it happen?** Read the situations below. Decide how likely each situation is. Use the adjectives from ❷ in your answer. For example, write *rare* or *impossible* or *likely*. Write your idea in the column "Your answer."

Find a partner and ask for his or her ideas. Write down his or her responses.

		Your answer	Your partner's answer
①	You will win the lottery someday.		
②	You flip a coin. It will turn up heads.		
③	It will snow in the Amazon rainforest.		
④	Maria got the chickenpox vaccine when she was a baby. She will get chickenpox as an adult.		
⑤	Andre smokes a pack of cigarettes a day. He will have health problems when he is older.		
⑥	Martin exercises three times a week, eats a healthy diet, and is not overweight. Martin will get diabetes.		
⑦	Greg's father has cancer so Greg will also have cancer.		
⑧	Lian is pregnant. She will have a baby girl.		

Share your answers with a partner. Compare. How are your answers the same or different?

❺ **More Vocabulary Study: Words with similar meanings.** Below is a list of words that have similar meanings to words shown in ❷.

Which of these words mean *unlikely*? Which words mean *more likely*? Add these words to the scale near the words that have the same meaning.

If you need help, use your dictionary or ask your teacher or a classmate for help.

definite	yes or no	out of the question
fifty-fifty chance	maybe	not possible
probable	not probable	improbable

Compare your scale with someone else's scale to check your understanding of the word meanings.

❻   **More Vocabulary Study: Adverbs that go with 'likely' and 'unlikely.'**

If you feel strongly that something will or will not happen, you can say:

very or *highly* likely
very or highly unlikely

Also, note that:

not likely at all = unlikely

If you feel less strongly that something will or will not happen, you can say:

somewhat likely
somewhat unlikely

❼ Work with a partner. Look at these pictures. Discuss the questions on the
next page.

Picture Story: What does "likely" really mean?

Questions about the story

Discuss the following questions with your partner.

1. What happens in this story? Use your own words and tell the story to a partner.

2. What is the man thinking when he goes home after the exam? What is he feeling? Why?

3. If this man were your friend, what would you tell him?

4. Has this experience ever happened to you? What did you do?

5. What questions should this man ask his doctor?

❽ **Understanding information about health risks.** Sometimes
doctors use pictures and graphs to help their patients understand what is
likely or unlikely to happen to their health. Here are some examples.

Work with your partner. Look at each picture or graph. Work together to
complete the sentences, using the words in the boxes.

Example #1

Risk of Getting Disease X

● = will not get
     Disease X

○ = will get
     Disease X
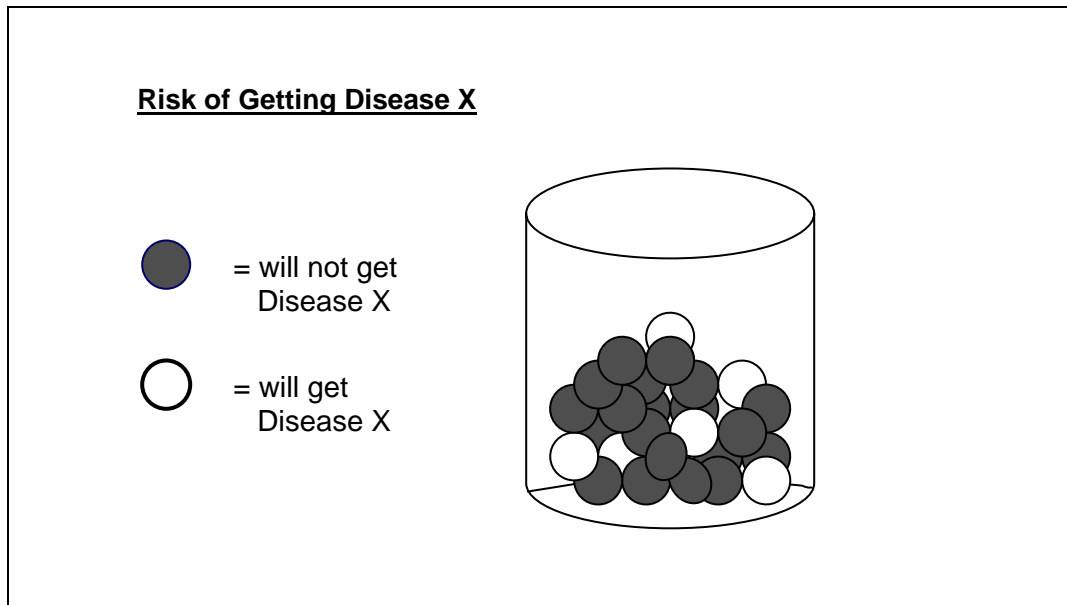
If we picked a marble from this jar, it is more
_____ that we would pick a_____
marble from the jar than a _____marble. This
means that it is _____ that we would get Disease
X.

unlikely

black

likely

white

Example #2

RISK OF GETTING DISEASE X (%) vs GENDER (MEN, WOMEN)
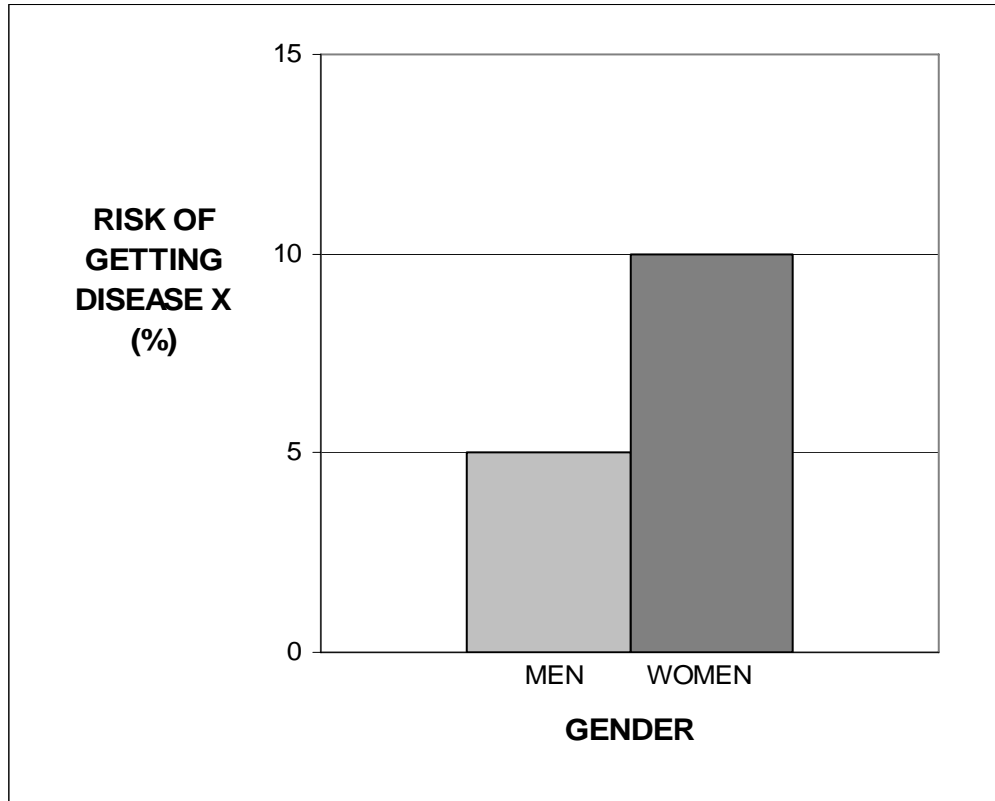
This graph shows that the risk of getting Disease X is not the same for _____ and _____. Women have a _____ percent chance of getting Disease X, while men have a _____ percent chance of getting Disease X. This suggests that men are less _____ to get Disease X compared to women.

likely

five

men

women

ten

Example #3

RISK OF
GETTING
DISEASE X
(%)

[Graph: Risk of getting Disease X (%) on the y-axis ranging from 0 to 40, versus AGE on the x-axis ranging from 25 to 75. The curve rises from about 2% at age 25 to about 30% at age 65.]

AGE
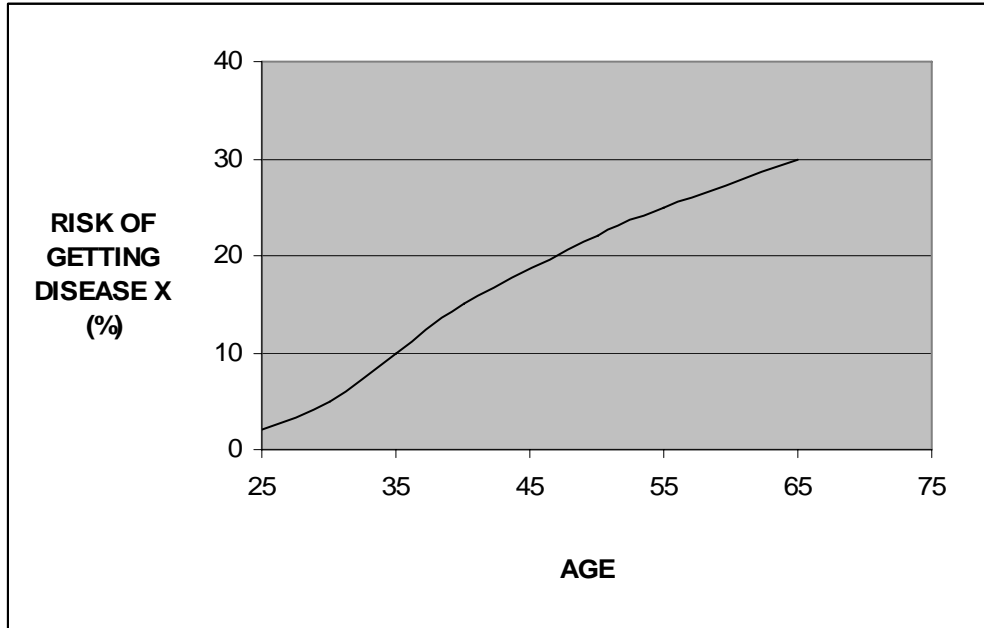
This graph shows that you are more _____ to get Disease X as you get _____. If you are _____, you have about a _____ percent chance of getting Disease X.

55

likely

25

older

Reading assignment: How likely is likely?

Read the paragraph and answer the questions below.

Imagine you are at the doctor's office. The doctor says to you, "You must exercise more and eat a better diet. If you don't, you are likely to get diabetes." The doctor is talking about your risk of getting diabetes. *Risk* is the possibility that something bad or dangerous will happen. But what does the doctor mean by *likely*? If you don't exercise and eat better, it doesn't mean you'll definitely get diabetes. And if you do exercise and eat a better diet, you may still get diabetes. How confusing!

Doctors often use words such as *rare*, *likely*, and *unlikely*, but they don't realize that patients don't always understand what they mean. If you don't understand something, ask your doctor to explain it to you. Remember, it is impossible to predict exactly what will happen with our health. But if you make sure you understand the words the doctors use, you have a better chance of taking good care of your health.

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1. What does the word "risk" mean to you?

2. Why are words such as *likely* often difficult to understand?

3. Have you ever talked to your doctor about your health risks? What happened?

4. What things can you do to make sure you understand your own health risks?

Lesson 11: (ABE) Introduction to Probability

Disease Prevention and Screening Task Addressed in this Lesson
▪ Understand health messages that are based on probabilities
 	
Skills Focus
▪ Students will practice calculating probability and estimating likelihood.
 	
ABE/ESOL Level
Intermediate ABE
 	
Time
2 hours
 	
Materials
Handouts
Coins for flipping (1/pair)
Paper bags (1/pair)
Colored balls or candy (1 set of 20/pair)
 	
Key Vocabulary
even chance
event
fifty-fifty
likelihood
outcome
probability
randomly selected
chance
odds
risk
statistician
weighted chance
	Purpose
	This lesson is designed to provide students with an introduction to the concept of probability. It includes hands-on activities to help students build understanding and calculate probability.
	
	Prerequisites
	This lesson assumes that students have some familiarity with fractions. Students are asked to understand fractions as expressions of probability; however no computation with fractions is required.
	
	Steps
	1. **Introduce the concept of probability (Large group discussion)**
	   Show students the following list of statistics related to health risks. (You may wish to write the statistics on the board, or create an overhead or handout to share this information. Note that you will revisit these statements later in the lesson.)
	
	   The American Cancer Society reports the following[1]:
	
	   Among women aged 40 to 59, the risk of developing breast cancer is 1 in 24.
	   For women up to age 39, the risk is 1 in 207.
	
	   Among men aged 40 to 59, the risk of developing prostate cancer is 1 in 39.
	   For men up to age 39, the risk is 1 in 9879.
	
	   Ask students the following questions:
	   Have you seen these kinds of statements before? Where?
	    (e.g., newspapers, doctors' offices, magazines, etc.)
	   What do you think when you see them?
	   (e.g., They seem scary, I don't understand)
	
	   What makes them difficult to understand?
	   (e.g., too many numbers, etc.)

[1]Note: These statistics were reported as of February 2006 at http://www.cancer.org/downloads/STT/CAFF2005f4PWSecured.pdf. These statistic may change periodically; therefore you may wish to update them with information from the statistics section of the American Cancer Society website.

Point out that the idea behind these kinds of statements is something known as
"**probability**".
- The word "probability" refers to how likely or unlikely it is that something
  will happen.
- We sometimes refer to probabilities as the chances or odds of something
  happening.

Explain that we use probabilities to tell us how likely a particular outcome is to occur
for a particular event. Clarify these terms with the examples listed below.

- An *event* can include things such as getting a gift, having a traffic-free
  morning commute, or having a snowstorm in your town. An event can also
  be[2]:

    A coin toss
    Rolling a die or rolling two dice
    Drawing a card from a deck of cards
    Drawing a marble from a bag of different colored marbles
    Spinning a spinner on a board game
    Playing the lottery
    Having a baby

- An *outcome* is the result of an event like those just described above.
    For instance, a coin toss has two possible outcomes – heads and tails.
    Rolling a regular six-sided die has six possible outcomes – 1,2,3,4,5 or 6.
    Drawing a card from a deck of cards has 52 possible outcomes – since
    each card is different.
    Playing the lottery has two outcomes – winning or losing.
    Having a baby typically has two outcomes – a boy or a girl – but can also
    have outcomes like twins, triplets, etc.

- The ***probability of an outcome*** for a particular event is a number that tells us
  how likely a particular outcome is to happen.   Lower probabilities mean that
  events are less likely, while higher probabilities mean that events are more
  likely.

    For example, when I roll a die (an event), how likely is it that I will roll a 3 (a
    particular outcome)?
    The probability of this outcome is the ratio of the number of ways I can roll a
    3 (only one way) divided by the number of total possible outcomes when I roll
    a die:

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[2] Adapted from *What is an event?* available at:
http://www.mathleague.com/help/percent/percent.htm#whatisanevent.

$\underline{1}$ (only one way to roll a three with only one die)

6   (the total number of outcomes possible when I roll a die)

(Note: If students are feeling confused at this point, let them know that you will do some activities in this lesson to make the idea of probability clearer.)

Explain what is meant by **health outcomes**.

- Health outcomes include a broad range of things, including giving birth to a healthy baby, living to 90, getting cancer, or having a heart attack.
- When medical people talk about the **chance** or **risk** of health outcomes, they are really talking about probabilities of these outcomes occurring. They are referring to how likely it is, for example, that someone will develop a certain disease.
- When doctors and other health professionals discuss health risks with a patient, they are using two sets of information.
    - *Health Statistics*. To understand health risks, doctors rely on what researchers have found out about how many and what types of people get certain diseases (e.g., men, women, smokers, older people, etc). Health statistics may also differ based on geography (country or city) and environmental factors (being exposed to things like pollution, chemicals).
    - *Individual Factors*. Next, doctors need to know about each patient. For example, they must consider a person's age, current health, test results, exposures and behaviors, and family history.

Explain to students that they will now take part in some activities to help them understand probability and to make better sense of health messages about disease risk.

2. **Coin Flipping[3] (Large Group discussion and small group work)**
   This activity uses the process of flipping a coin to help students understand a basic probability of 1 in 2 or a fifty-fifty chance.

   Tell students that you will now look at a common example of probability with which students may be familiar – tossing or flipping a coin. Ask students the following questions:

   How many of you have ever flipped a coin?
   Why do people flip coins?
   What are the possible outcomes?
   Is flipping coins a fair game? Why?

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[3] This activity is adapted from *Probability Games*. *Statistics in Your World,* available at: http://www.rsscse.org.uk/pose/level1/.

Tell students that you will ask a volunteer to flip a coin.
- First ask students to raise their hands if they think the coin will come up "heads" (get a count) and then ask the same for "tails."
- Then ask the volunteer to flip a coin.

Repeat these two steps. Call attention to the outcomes – were they the same or different in the two tosses?

Explain to students that statisticians (people who work with numbers and issues of chance and probability) are able to show that over time, the chance of getting heads is the same as the chance of getting tails. The probability of getting heads can be written as ½. The same fraction or ratio would be used for tails.

You may also want to note that if a woman is expecting a (single) baby, the probability of having a boy or a girl is also represented by this fraction – ½.

Point out that we can write the probability of getting heads (or tails) as ½ or as .50 or 50%. When the probability of an event is ½ or 50%, we say there's a "**fifty-fifty**" chance of that event occurring. In this case, we have a fifty-fifty chance of getting heads (or tails). The probability of getting one side in a toss is the same as the probability of getting the other.

Explain that students will now have a chance to test whether what statisticians say is true – that there is a 50% chance of getting either heads or tails.

Divide the class into five groups. Have each group flip a coin 20 times and record their findings on a sheet. (You want the class to complete a total of 100 coin flips.) Each group should record their results in the **Coin Flipping handout** with tally marks in each column. When they have tossed the coin 20 times, the group should add up the marks in each column and note the totals at the bottom of the page as indicated on the handout.

Next, each group should report how many times they got heads and tails. You should list these totals on the board. Then add up the total for heads and for tails, and average each for the class. (If you had five groups each flipping a coin 20 times, you should divide by 100 to get an average). The average for heads and for tails should each be around 50%. (You may find that students report results such as 48 heads and 52 tails, or 49 heads and 51 tails. If you average these numbers, you should still come out at about 50.)

Ask if students agree with the statisticians about the 50% chance of getting heads or tails and why.

Note to Teachers: If your class has access to computers, you may wish to have students simulate coin flipping by using Ken White's Coin Flipping site: http://shazam.econ.ubc.ca/flip/index.html. (Accessed April 2006)

3. **An Even Chance and a Weighted Chance (Large group discussion and pairwork)**
   Explain *even* versus *weighted* chance with examples by presenting the following scenario to the class.

   > *Imagine that I want to choose one of you to help me, but I want to be fair and give you all an equal chance. How might I go about doing this?*
   > (e.g., Put names in a hat and draw one without looking.)

   Next, tell the class that you want them to determine the probability that X (name a student) will be chosen. Use the following scenario:

   > *Let's say that I ask each of you to print your name on a piece of paper. We then put each piece of paper in a bag. What is the probability that X will be chosen?*
   > (e.g., If there are 11 people in the class, the probability is one out of eleven or 1/11. If there are 20 people in the class, the probability is one out of twenty or 1/20.)

   Move through as many options as are needed. Tell the class that this kind of selection process is known as a *random* process because each person has the same chance, or an **even chance**, of being chosen.

   Next, give the class an example where the chances of being chosen are not even. Use the following scenario:

   > *Let's say that I hold the same bag with everyone's name on a piece of paper. This time, I tell you that I want a man (or a woman) to help me with the project. Imagine that my class has 20 people in it and 8 of them are men.*
   >   - *What are the chances of a man being chosen?*
   >   - *What are the chances of a woman being chosen?*
   >   - *Who is more likely to be chosen?*
   >   - *Why?*

   The probability of choosing a man is 8/20; of a woman is 12/20. Therefore, it is more likely that a woman will be chosen because there are more women. Uneven chances like this are sometimes called **weighted** chances.

   To review, write the following on the board:

   Even chance means each person has the same chance.
   Weighted chance means not even; some people have a better chance of being chosen because there are more of them.

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4. Colored Balls Probability Activity

This activity allows students to practice working with probabilities for multiple outcomes. In this activity, students are told the contents of a brown paper bag that contains 20 colored marbles or candies (such as M&Ms or Skittles) as follows:

> 6 blue balls
> 4 green balls
> 7 yellow balls
> 3 red balls

Ask students to work in pairs. Remind students that we determine probability by dividing the number of ways we can get a particular outcome by the total number of outcomes possible.

> # of ways of getting particular outcome (divided by)
> # of possible outcomes

> To make this formula clearer, use the balls scenario as an example:
> *What is the chance of pulling a blue ball out of our bag of 20 balls?(6/20)*

Distribute the **Colored Balls Worksheet**. Ask pairs to complete the worksheet. You may wish to work on worksheet question 1 (see below) as a class and then leave pairs to complete the rest of the activity on their own. Circulate to see if students are carrying out the process correctly and to answer any questions that arise. An answer key is provided on the next page.

Colored Balls Worksheet (Answer Key)

1. What is the probability of choosing each color:
    (blue 6/20, green 4/20 or 1/5, yellow 7/20, red 3/10)

2. List the colors in order from least likely to be picked to most likely to be picked (or drawn).
    (red, green, blue, yellow)

3. Which color ball do you expect to pick first? Why?
    (Answers may vary – some may say yellow because they are the most numerous.)

NOTE: The answers to questions 4, 5, and 6 will vary ONLY IF students DO NOT put the marble/candy back in the bag, as their worksheet indicates. You may want to point this out to students. If they, for example, eat the candy, then the number of items in the bag changes, as does the number of a particular color group.

4. Now, without looking in the bag, take out one ball. What color is it? Is it the color you predicted? List how many balls of each color remain in the bag, after you take out this ball.

    _____   blue
    _____   green
    _____   yellow
    _____   red

    How many balls are there in the bag now? [19]

5. Now, what is the probability of choosing each color? [all based on 19 total but with a change for one of the color groups]

    _____   blue
    _____   green
    _____   yellow
    _____   red

    How did these probabilities change from what you noted in question 1?

6. Given the contents of the bag now, which color do you think you are most likely to choose next? Which color are you least likely to choose next? Why?
    most likely: _____   least likely: _____

NOTE: Students pick out a ball 3 times and answer a set of questions like 3-6 each time.

(Lesson plan continued)

Once students have completed the Colored Ball activity, ask them to share their experiences. Ask the following questions to prompt discussion:

How well did you predict what color you would pick each time?
Would you make different predictions in the future?
What did you observe about how probabilities change?

Be sure to point out that probabilities change as circumstances change – in this case, each time students drew a ball, the number of balls in the chosen color changed, and the total number of balls changed, so the probabilities for each color changed.

Summarize what students have observed so far:

- We have seen that the probability of an event is based on how likely that event is to occur.
- The *likelihood* of an event depends on how many ways that event can happen and how many possible outcomes there are.
- We have seen how the probability of two outcomes can be the same – or average out to be the same, as with flipping a coin and getting head or tails. In such a case, we talk about the chances of events happening as *even.*
- In the Colored Balls activity, we saw that chances can be uneven, or weighted, like the chances of getting the different colors from each bag.
- We have also seen how some probabilities (coin flipping) remain the same, because nothing changes over time, while other probabilities change because circumstances change (as with the colored balls).

5. **Analyzing health messages with probabilities (Large and small group work)**

Tell students that you will now revisit the statements that you saw at the beginning of the lesson. Show the statements to students again:

The American Cancer Society reports the following:

Among women aged 40 to 59, the risk of developing breast cancer is 1 in 24.
For women up to age 39, the risk is 1 in 207.
Among men aged 40 to 59, the risk of developing prostate cancer is 1 in 39.
For men up to age 39, the risk is 1 in 9,879.

Ask students to read each of the statements again and then rank the statements in order from *most* likely to *least* likely.   Have students write down their answers on a piece of paper – they may simply list the probabilities as follows:

    1 in 24
    1 in 39
    1 in 207
    1 in 9,789

Once students have had a chance to write down their answers, ask for volunteers to tell which event they thought was most and least likely and why. **Accept all answers at this point. Do not confirm any answers as correct**.   Some research in health risk communication has indicated that people with low math skills tend to automatically associate higher numbers in the denominator with greater risk.

Next, point out to students that information about health risks can be presented in a number of ways. One way is to use sentences, as they have just seen. Another is to use pictures to help represent probabilities. Distribute the handout **Another Look at Probabilities** to small groups of two or three students. Ask students to look at the pictures (groups of **O** and �֍) that correspond to each of the health risk statements noted above. Explain that in each picture (group), the **O**'s represent people who do not have the disease, while the ✖ represents the person that does have the disease. Give students 5 to 10 minutes to review and discuss the pictures. Then ask students to review their ranking of the likelihood of the health statements and decide if they would like to make any changes based on the pictures.

6. Conclusion

Reassemble the whole class and ask students to comment on the following:

> *How did your ranking of the statements change (if at all) after looking at the pictures?*
> (Answers may vary, as some students may have interpreted the statements similarly in both representations, while others came to a different understanding through pictures. Some research has suggested that people often misinterpret these kinds of statements, thinking that larger numbers mean a risk is greater.)

Once students have shared their thoughts on the experience, and if no one has given the correct order, be sure to convey the correct order from most to least likely:
1 in 24   1 in 39   1 in 207   1 in 9,789

Explain that the larger the second number (or bottom number in a fraction), the less likely is the one event, since that event represents a smaller proportion of the total possible outcomes.

How do you prefer to have information about health risks presented to you – in sentences with probabilities or pictures, or both? Why?
(Answers will vary.)
Imagine that, at your next physical, your doctor talked to you about your risk of getting a certain disease and you didn't understand what that risk meant (if it is a serious risk for you or not). What questions could you ask your doctor to help you better understand what your risk of getting the disease is?
(Answers might include: Do I have something like a 1 in million chance or a 1 in 100 chance of getting this disease? Can you draw me a picture to help me understand my risk of getting this disease?)

Follow-up Activities

A. Representing the Probability of Events: Ask students to think of five different events – they can be any kind of events (weather, winning the lottery, taking a trip, achieving a goal, buying something, getting a date with a special person, etc.). Have students:

    a. Give a fraction probability statement to indicate how likely the event is.

    b. Develop a graphic representation of how likely the event is (using pictures like those used in this lesson, showing the event as part of a pie or a cake, or any other form they choose).

    c. Present their work in the next class.

You may wish to work through one student-generated example to be sure that everyone understands the assignment for homework.

B. Using Probabilities for Decision Making: Have students look at a story strip that depicts a couple about to decide whether or not to have an amniocentesis. (See the **Materials for Follow-up Activity 2**, which include instructions for using the **ESOL Picture Story: Tough Decision**, included at the end of this lesson.) Ask students to read the story and think about what advice they might give the couple, based on the probability statements provided. Ask students to prepare to explain how they arrived at their decision in the next class.

C. Exploring Health Risks: Have students explore the concept of health risks through Web sites designed to offer personal risk assessments. The following website offers links to assessments of risk for heart disease, diabetes, osteoporosis, cancer, and stroke.   This activity might work well with a whole class in a computer lab.

Visit the Harvard Pilgrim Health Care – Assess My Health Risks Web site at:
http://www.harvardpilgrim.org/portal/page?_pageid=213,38394&_dad=portal&_schema=PORTAL

Technology Tips

✓ **SMILE Program Mathematics Index**
This site, provided by the Illinois Institute of Technology, is part of the Science and Mathematics Initiative for Learning Enhancement (SMILE) program that seeks to "enhance the elementary and high school learning of Science and Mathematics through the use of the phenomenological approach." The site has links to a number of lesson plans that pertain to probability. Each lesson includes hands-on activities that promote experimentation, observation, and analysis. Visit the SMILE Web site at http://www.iit.edu/~smile/.

✓ **Exploring Risk Factors**
The on-line GED 2002 Teacher's Lesson Bank includes a lesson titled *Protect Your Heart*, which covers a discussion of risk factors for heart disease and stroke and provides students with practice in graphing and planning for healthy actions. Elements of the lesson can be adapted to pre-GED students. The lesson plan and materials are available at:
http://www.floridatechnet.org/GED/LessonPlans/Science/sciencelesson35.pdf.

Coin Flipping

Heads	Tails
Total	**Total**

Colored Balls Worksheet

You have been given a bag of 20
colored balls. The bag contains

        6 Blue
        4 Green
        7 Yellow
        3 Red
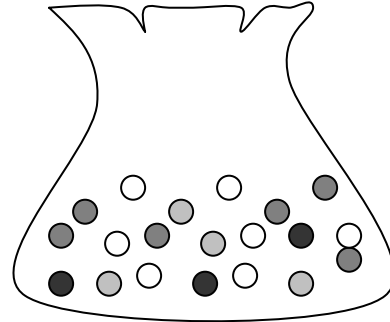
1. What is the probability of choosing each color?

        Blue   _____

        Green   _____

        Yellow   _____

        Red   _____

2. List the colors in order from least likely to be drawn to most likely to be drawn.

                  _____

                  _____

                  _____

                  _____

Drawing #1

3. What color do you expect to take out of the bag first? Why?

4. Now, without looking in the bag, take out one ball. What color is it?
    Is it the color you predicted?
    List how many balls of each color remain in the bag after you take out this ball.

    _____ blue

    _____ green

    _____ yellow

    _____ red

    Note: Do <u>not</u> put the ball you just took out back into the bag.

    How many balls are there in the bag now?

5. Now, what is the probability of choosing each color?

    _____ blue

    _____ green

    _____ yellow

    _____ red

How did these probabilities change from what you noted in question 1?

6. Given the contents of the bag now, which color do you think you are most likely
    to choose next? Which color are you least likely to choose next? Why?

    most likely: _____   least likely: _____

Drawing 2

7. Now, without looking in the bag, take out one ball. What color is it? Is it the color you predicted?
List how many balls of each color remain in the bag after you take out this ball.

_____ blue

_____ green

_____ yellow

_____ red

Note: Do <u>not</u> put the ball you just took out back into the bag.

How many balls are there in the bag now?

8. Now, what is the probability of choosing each color?

_____ blue

_____ green

_____ yellow

_____ red

How did these probabilities change from what you noted in question 1?

9. Given the contents of the bag now, which color do you think you are most likely to choose next? Which color are you least likely to choose next? Why?

most likely: _____   least likely: _____

Drawing #3

10. Again, without looking in the bag, take out one ball. What color is it? Is it the color you predicted?
List how many balls of each color remain in the bag after you take out this ball.

_____ blue

_____ green

_____ yellow

_____ red

Note: Do <u>not</u> put the ball you just took out back into the bag.

How many balls are there in the bag now?   _____

11. What is the probability of choosing each color now?

_____ blue

_____ green

_____ yellow

_____ red

How did these probabilities change from what you noted in questions 1 and 11?

12. Given the contents of the bag now, which color do you think you are most likely to choose next? Which color are you least likely to choose next? Why?

most likely: _____   least likely: _____

Another Look at Probabilities

Among women aged 40 to 59, the risk of developing breast cancer is 1 in 24.

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For women up to age 39, the risk of developing breast cancer is 1 in 207.

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Among men aged 40 to 59, the risk of developing prostate cancer is 1 in 39.

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For men up to age 39, the risk of developing prostate cancer is <u>1 in 9,879</u>

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Materials for Follow-up Activity 2: Using Probabilities for Decision Making

Picture Story: Tough Decision

For the teacher:
This exercise is meant to help students think about the tough decisions we face when a doctor advises us to have a health test or a screening test. We need to think about the valuable information the test may give us, as well as any risks of having the test. This picture story is about a couple who have to make a tough decision about getting an **amniocentesis**, a test for pregnant women that enables you and your doctor to get information about the unborn baby. This test is usually done when a woman is about 4 months pregnant. The test can help the doctor learn certain things about the health of the baby, such as whether a baby has genetic or chromosomal disorders, like Down syndrome. The test is not regularly given to all pregnant women because there is a risk of miscarriage and infection. However, women who are going to be 35 or older when their baby is born are often advised to get the test, as the risk of chromosomal disorders increases with age.

Story Overview: A woman goes to see her doctor and learns that she is pregnant. The woman is very happy. The woman goes home and tells her husband the good news. They are very excited. Two months later, the woman goes back to the doctor for a check-up. The doctor tells her that she should think about amniocentesis because she is 36 years old. The doctor gives her some information about amniocentesis. The information includes data about the chances of having a baby with Down Syndrome for women of different ages. The information also talks about the risk of miscarriage or infection as a result of having the test. The woman looks worried. The woman goes home to talk to her husband. She does not know what to do. Her husband does not know what to do either.

Here are some discussion prompts for beginning-level learners who may need help comprehending the story:

Frame 1: Who are the two women? Where are they? What is the doctor saying to the woman? What do you think the woman (the patient) is feeling?

Frame 2: Where is the woman now? Who is she talking to? What are the two people feeling?

Frame 3: When is this happening? What is the doctor saying? What will the doctor do next? What do you think the woman (patient) is thinking?

Frame 4: What is this information? What does it mean? What makes this information hard to understand? (Follow-up: Have you ever gotten information like this from a doctor? Did it make sense? What did you do?)

Frame 5: What is this next information? What does it mean? What makes this information hard to understand? (Follow-up: Have you ever gotten information like this from a doctor? Did it make sense? What did you do?)

Frame 6: Where is the woman now? What are the people talking about? What do you think they are feeling now? Why?

After discussing Frame 6, emphasize to the students that the information about the risks and benefits of getting a test can sometimes be very confusing. It's not always clear what the "right" thing to do is. This picture story provides the class with an opportunity to discuss what it means to make an "informed choice," which can be defined as a person's ability to make a choice based on accurate, clear, and useful information and based on a clear understanding of their health needs. Ask your students to talk about the meaning of this phrase. Encourage them to use their dictionaries or the Internet for information about the meaning of the words.

Be sure that students understand the basic plot of the story before they answer the following discussion questions.

1. What happens in this story? Use your own words and tell the story to your partner.

2. What is the woman thinking after the doctor tells her she should think about getting an amniocentesis? What do you think the couple is feeling? Why?

3. If this couple were your friends, what would you tell them?

4. Has this experience ever happened to you? What did you do?

5. What kinds of questions can we ask if our doctor recommends that we have a health test and we're not sure what to do?

ESOL Picture Story: Tough Decision
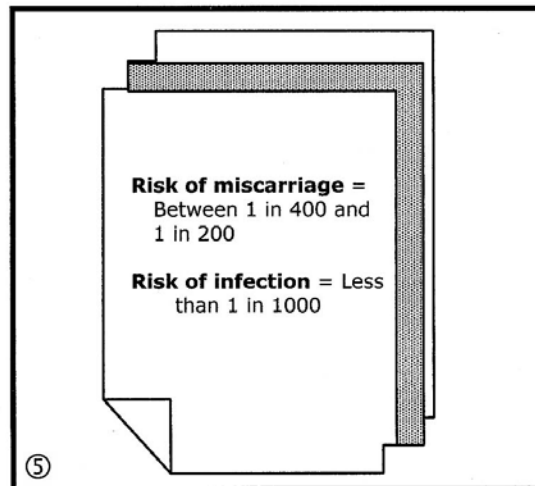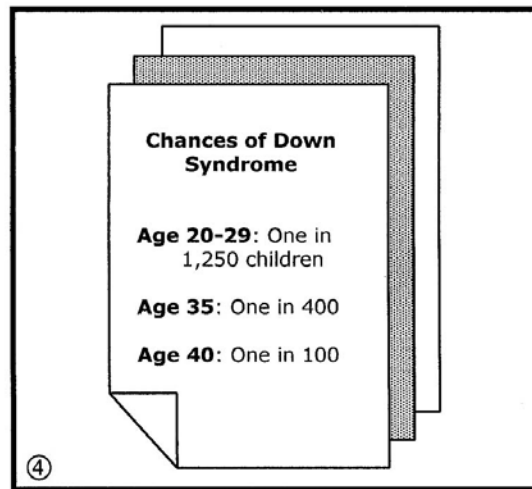
Source for information on amniocentesis: March Of Dimes, http://www.modimes.org
© Maricel Santos/ Picture story format based on work by Kate Singleton (2002)

Lesson 12: (GED) Exploring Health Risks as Probabilities

Disease Prevention and Screening Tasks Addressed in this Lesson
- Interpret information on health risks
- Use information on health risk to inform decision-making

Skills Focus
- Students will practice using and interpreting different mathematical expressions of probability.
- Students will practice using calculators to convert among fractions, decimals and percents.

ABE/ESOL Level
GED

Time
2 to 2-1/2 hours

Materials
handouts
calculators

Vocabulary
chance
event
odds
outcome
risk

Purpose
Information on disease prevention and health risks is often communicated in mathematical terms, such as fractions (1/10) or ratios (1 in 200) or as percents (50% chance). This lesson provides students with a framework for understanding the likelihood of events, including the development of diseases or other health conditions. This lesson teaches students to recognize math expressions used to express probability. Students also practice interpreting probability expressions by converting among fractions, decimals, and percents.

This lesson can be taught on its own or adapted as a follow-up to the ABE lesson: Introduction to Probability, included in the Study Circle[+] lesson packet.

Prerequisites
This lesson assumes that students have some familiarity with fractions, decimals and percents. Activities provide students with opportunities to practice converting among these forms as expressions of probability.

Steps

1. **Introduction (Large group discussion)**
   Show students the following list of health news topics with statistics on health risks:
   - *Over the course of a lifetime, women have a 1 in 8 chance of developing breast cancer.[1]*
   - *There is a 25 percent chance that a child born to parents who both carry a sickle cell anemia gene will have sickle cell disease.[2]*
   - *Exercising three hours per week can lower your risk of heart disease by 30%.[3]*

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[1]*Breast Cancer: The Basics.* Available at:
http://www.oncolink.org/types/article.cfm?c=3&s=5&ss=33&id=8320
[2] *Sickle Cell Disease* Available at: http://www.marchofdimes.com/professionals/681_1221.asp
[3] E*xercise and Diet.* The Center for Women's Health, Columbia University. Available at:
http://hora.cpmc.columbia.edu/dept/cwh/exercise.html

Ask students the following questions:
- *Have you seen or heard statements like this before? Where?*
- *What information do they tell us? What do these numbers mean?*
- *How useful do you find these statements? Why?*

Point out that the idea behind these kinds of statements is something known as
"**probability**".
- The word "probability" refers to how likely or unlikely it is for something to happen.
- We sometimes refer to probabilities as the *chance* or *odds* of something happening.

Explain that we use probabilities to tell us how likely a particular outcome is to occur for a particular event. Explain the bolded terms below as suggested.
- An **event** can include things such as getting a gift, having a traffic-free morning commute, or having a snowstorm in your town.
- An event can also include the following[4]:
  - a coin toss
  - rolling a die or rolling two dice
  - drawing a card from a deck of cards
  - drawing a marble from a bag of different colored marbles
  - spinning a spinner on a board game
- An **outcome** is the result of an event like those just described above.
  For instance, a coin toss has two possible outcomes – heads and tails.
  Rolling a regular six-sided die has six possible outcomes – 1, 2, 3,4,5 or 6.
  Drawing a card from a deck of cards has 52 possible outcomes, since each card is different.
- The **probability of an outcome** for a particular event is a number that tells us how likely a particular outcome is to happen.

Present the following example to students:

> *How likely is it that I will roll a 3 when I roll a die?*

The probability of this outcome is the ratio of the number of ways I can roll a 3 (only one way) divided by the number of total possible outcomes when I roll a die:

<u>1</u> (only one way to roll a three with only one die)
6   (the total number of outcomes possible when I roll a die)

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[4] Adapted from *What is an event?* Available at:
http://www.mathleague.com/help/percent/percent.htm#whatisanevent

Note to teacher: If students are feeling confused at this point, let them know that you will do some activities in this lesson to make the idea of probability clearer.

Explain the concept of **health outcomes** as suggested below.

- Health outcomes include a broad range of things, including giving birth to a healthy baby, living to 90, getting cancer, or having a heart attack.
- When medical people talk about the **chance** or **risk** of health outcomes, they are really talking about probabilities of these outcomes occurring. They are referring to how likely it is, for example, that someone will develop a certain disease.
- When doctors and other health professionals discuss health risks with a patient, they are using two sets of information.
  - *Health Statistics.* To understand health risks, doctors rely on what researchers have found out about how many and what types of people get certain diseases (e.g. men, women, smokers, older people, etc). Health statistics may also differ based on geography and environmental factors.
  - *Individual Factors.* Next, doctors need to know about each patient. For example, they must consider a person's age, current health, tests results, exposures and behaviors, and family history.

2. **Probability Vocabulary Review (Large group discussion and pairwork)**

Present a list of some terms associated with probability:

very likely, probable, impossible, highly probable, certain, unlikely, possible, very unlikely

Ask students to rank these terms according to certainty, from least certain to most certain. Ask for any other similar terms they may know that could be added to this list.

Remind students that, as noted above, probability applies to all sorts of events – everything from winning the lottery to what the weather will be like to the chances of getting a particular disease.

Using either an overhead or a handout, present students with a list of events like that below. (Feel free to modify the list to increase its relevance to your students).

It will snow next Christmas Day.
You will watch the news on television tonight.
You will be on time for work tomorrow.
You will see a zebra pulling a cart on the road on your way home tonight.
You will buy a new pair of shoes this month.
The weather will be cold tomorrow.
You will win the lottery.
You will go sky-diving this weekend.

You will need new glasses in the next year.
*Your teacher will speak to you in Thai during this class.*

Ask students to take 5 minutes to work with a partner and assign one of the probability terms noted above to each statement. After 5 minutes, ask volunteers to share their answers. Point out, as will likely be clear from student responses, that some events – like buying new shoes or needing glasses -- will be more likely for some people than for others.

3. **Introduce the Probability Scale (Large group discussion and pairwork)**

Note that while we can talk about probability with words like *very likely* or *impossible*, very often probability is discussed in terms of numbers.

Point out that all probabilities fall between 0 and 1. A probability of 0 means that an event is impossible while a probability of 1 means that an event is certain to happen. Lower probabilities mean that events are less likely, while higher probabilities mean that events are more likely.

Draw the following scale on the board or an overhead transparency and explain its use as discussed below.

The Probability Scale

impossible	*fifty-fifty*	*certain*
0	.5	1
0 %	50%	100%
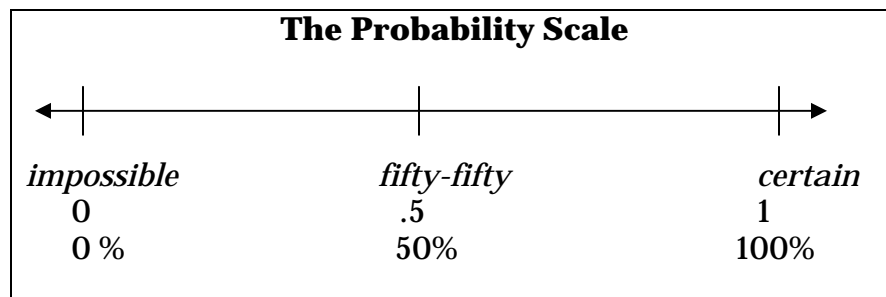
Point out that the decimals on the probability scale correspond to percentages. So if an event had a probability of .9, we could say that the probability of that event is 90%, or that there is a 90% chance that that event will happen. When we hear statements about an event being 90% certain, we know that there is a very good chance that the event will occur. On the other hand, if something has a 10% chance of occurring, it is pretty unlikely that that event will happen. The number .5 represents what we often call a "fifty-fifty" chance (a 50% chance) – which means that it is as likely that an event will occur as it is likely that it will not occur.

In order to help us understand how likely an event is to happen, we can think about where it would fall on the probability scale. Ask students to revisit the list of events they looked at earlier in the lesson. Have students again work in pairs to assign a percentage to each event as a way of expressing the likelihood of that event. You may wish to focus on one statement as an example:

You will be on time for work tomorrow.
Earlier, I said that this event was very likely. Now, I might say that the
probability of that event is 90% – since I'm on time for work almost every day
and I feel very certain I will be again tomorrow.

Ask students to share some answers.

4. **Review mathematical expressions of probability (Large group review and
    individual practice)**

Explain that decimals and percents are two different ways of expressing probabilities.
Probabilities can also be expressed as fractions. Write the following examples on the
board for students to see as you review them.

> For example, a probability of

> .1 = 10% = 10/100 (1/10) [1 in 10 chance of the event happening]

> .5 = 50% = 50/100 (1/2) = [1 in 2 chance]

> .25 = 25% = 25/100 (1/4) [1 in 4 chance]

Remind the students that we often refer to these expressions as **statistics.** Health
messages often contain statistics that we need to understand in order to fully
understand those messages.

Distribute the **Expressions of Probability worksheet** and ask students to complete
the table like the one below. Invite students to use calculators for this exercise.
Depending on your students' facility with these calculations, you may wish to review
possible ways to get the equivalent expressions:

If you start with a decimal, turn it into a fraction
e.g. .30 = 30/100 = 30% = 3 in 10 chance [reduce 30/100 to 3/10)

If you start with a fraction, divide the numerator by the denominator to get a
decimal.
e.g, 1/6 = .1667 = 17/100 = 17% = 17 in 100 or 1.7 in 10 chance

If you start with a percentage, turn it into a fraction, then get a decimal

e.g., 75% = 75/100 (or ¾) = .75 = 3 in 4 chance

Review the answers (listed in the table below) as a class and answer any questions
students may have.

Expressions of Probability – Answer Key

Decimal	Percentage	Fraction	Chance/Odds
.10	10%	$\frac{10}{100} = \frac{1}{10}$	1 in 10
.30	30%	$\frac{30}{100} = \frac{3}{10}$	3 in 10
.75	75%	$\frac{75}{100} = \frac{3}{4}$	3 in 4
.17	17%	$\frac{1}{6}$	1 in 6
.11	11%	$\frac{1}{9}$	1 in 9
.05	5%	$\frac{5}{100} = \frac{1}{20}$	1 in 20
.001	.1%	$\frac{1}{1,000}$	1 in 1,000
.88	88%	$\frac{7}{8}$	7 in 8
.90	90%	$\frac{90}{100} = \frac{9}{10}$	9 in 10
.02	2%	$\frac{2}{100} = \frac{1}{50}$	1 in 50

5. Assessing the likelihood of events (Four corners and pair work)

In this activity, you will ask students to consider four causes of death (car accident, plane crash, being hit by a car, being struck by lightning). Students will choose which cause they think poses the greatest risk to the average person in the U.S. and then position themselves in an area of the room associated with that cause. Students then think about their choices and discuss how their perceptions of risk are developed. Finally, students brainstorm questions they can ask their doctors to help clarify health risk messages.

List the following four potential causes of death on the board or overhead.

>Car accident
>
>Plane crash
>
>Being hit by a car or other vehicle
>
>Being struck by lightning

Ask students to think silently about which cause of death they think is most likely; that is, which cause poses the greatest risk to the average person in the U.S. over the course of a lifetime. Assign each cause of death to one corner of the room. Place a piece of newsprint in each corner with the name of the cause of death on it. Give students 2 minutes to move to the corner that corresponds to the cause of death that they think is most likely (not necessarily to them – but generally speaking).

Once students have arrived at their chosen location, ask volunteers to explain their choices to the whole class. Ask students to note what factors influenced their choice of the most likely event.

Next, ask students to split into pairs and give each pair a set of 4 post-it notes with the following statistics on them (1 statistic per note):

>1 in 83, 930
>
>1 in 4,023
>
>1 in 247
>
>1 in 608

On the newsprint in each corner, ask students to post the statistic that they think corresponds to the probability of each cause of death/event. Once students have done this, you can reveal the correct matching statistic for each cause of death. Ask students to comment on what they notice about their predictions and the actual probabilities.

	lifetime odds
car	1 in 247
air	1 in 4,023
pedestrian	1 in 608
lightning	1 in 83, 930

Note: These statistics are from the National Safety Council (NSC).[5] They are based on data from the National Center for Health Statistics and U.S. Census Bureau.

6. Review student perceptions of risk (Large group discussion)

Pose the following questions to the class for discussion.

How did your perceptions of risk (your ideas before seeing the statistics) differ from the statistics?
(e.g., I thought it was riskier to be a pedestrian than to be in a car.)

What kinds of things influence how you view the risk of events such as these?
Answers may include: [6]
    Personal experience
    Cultural attitudes and beliefs
    What we see in newspapers, magazines, and on TV
    Not understanding science well
    Whether something is familiar (diabetes) or exotic (West Nile virus)
    Whether something is common (flu) or dreaded (cancer)
    Whether something is a natural risk (lightning) or man-made (chemical contaminants)

What kinds of things might influence how you feel about health risks?
Answers may be similar to those above, and may include comfort with habits, such as smoking, eating, exercise, etc.

Point out that researchers who have looked at our understanding of risk have noted that our perception of risk is influenced by whether a hazard is present (e.g., whether there are reports of West Nile virus in our state or city), how much we are exposed to the hazard (e.g., how often we actually fly on an airplane), how much we feel threatened by the hazard, plus how much control we feel we have over whether or not the event occurs[7].

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[5] The NSC website explains lifetime odds as follows: one year odds are approximated by dividing the 2001 population (285,093,813) by the number of deaths. Lifetime odds are approximated by dividing the one-years odds by the life expectancy of a person born in 2001 (77.2 years).
http://www.nsc.org/lrs/statinfo/odds.htm

[6] Adapted from *Communicating About Risk: Implications for Public Health and Clinical Practice* by James Hyde, Associate Professor, Tufts School of Medicine Presented at The American College of Preventive Medicine, San Antonio, Texas February 20, 2002
http://www.hsph.harvard.edu/healthliteracy/slides/hyde_01.html

[7] Adapted from *Communicating About Risk: Implications for Public Health and Clinical Practice* by James Hyde, Associate Professor, Tufts School of Medicine Presented at The American College of Preventive Medicine, San Antonio, Texas February 20, 2002
http://www.hsph.harvard.edu/healthliteracy/slides/hyde_01.html

7. Conclusion: Improving communication with doctors about health risks (Small group discussion)

Point out that, so far in this lesson, students have explored the concept of probability and ways that probability can be expressed – as words (likely, very likely, etc.) and numbers (fractions, percents, decimals and odds).

To conclude the lesson, you will ask students to think about how they can improve their understanding of risk when they meet with health professionals.

Distribute the **Talking About Risk in Health Care Settings** handout. Ask students to work in groups of 3 to focus on one of the 5 scenarios listed on the handout. You may wish to assign scenarios to groups to be sure that all 5 scenarios are discussed. Ask students to think about what questions they could ask the doctor in response to the health risk message the doctor tells each patient.

Give students around 10-15 minutes to discuss the problems and prepare to share their ideas with the class. When groups are ready, ask a representative from each group to share ideas and record them on the board.

Talking About Risk in Health Care Settings
(Teacher Version)

1. *Mario's father died of prostate cancer, so his doctor has told Mario that he is "at
   risk" of getting the disease too. What questions could Mario ask to more clearly
   understand his risk of getting the disease?*
   (e.g., How likely is it that I will get cancer? Can you use numbers or show me on a
   scale? What can I do to reduce my risk?)

   Do you think Mario should be concerned about his risk of prostate cancer? Why?
   (Answers will vary – Just because he's at risk doesn't mean he will get it. There may
   be things he can do to lower his risk.)

2. *Joyce goes to the doctor for a check-up. During the visit, her doctor tells Joyce that
   given her age, current health and family history, she has a 1 in 200 chance of
   developing a certain type of cancer. Joyce has never heard this kind of information
   before and is confused by the numbers. What could she ask the doctor to do to make
   his message clearer?*
   (e.g., What does 1 in 200 mean – is that very likely, not very likely, almost certain?
   Can you show me a picture? What can I do to reduce my risk?)

   Do you think Joyce is at great risk of developing cancer? Why?
   (Answers may vary: 1 in 200 doesn't seem like a great risk to me. Or, 1 in 200
   sounds risky to me.)

3. *Simon has a problem with his heart and needs surgery. The doctor said that there's a
   30% chance that the operation will not work. What questions could Simon ask to
   learn more about the risks involved in his surgery?*
   (e.g., What does 30% mean? What is the chance that the surgery will work? What if I
   don't do the surgery? (This last question is not pertinent to interpretation of
   probability but relevant to the conversation overall.)

   Does Simon's surgery sound very risky to you? What would you advise him to do?
   (Answers will vary. Some people may feel that a 70% chance of success is enough,
   while others may not.)

4. *Elena has arthritis. Her doctor gave her a new medicine and said that there's a 60%
   chance that the medicine will help her. What questions can Elena ask to understand
   what this means.*
   (e.g., So, there's still a 40% chance it won't work? What are the side effects? What
   will happen to me if I don't take this medicine? Are there others I can take?)

   Do you think it's a good idea for Elena to take the medicine? Why?
   (Answers will vary. Some people may feel that 60% is not good enough, especially if
   there are side effects of the medicine.)

In bringing the discussion to a close, you will want to highlight the following:

- It is especially important to ask questions in a doctor visit when you are discussing the risk of getting a disease, or the risks of a certain treatment or procedure.

- What doctors tell us about risk – the probability, or statements like being "at risk" - will mean different things to different people. For some, a 70% chance of success is good enough, while for others it may not be. Get information from your doctor, ask questions so you understand your situation, and then do what's comfortable for you.

Conclude the lesson by directing students to an appropriate follow-up activity.

Note to teacher: Following this lesson, you may wish to prepare a summary handout based on this discussion for students to have for future reference when visiting a doctor. You may wish to include the following points[8]:

- *Ask for the risk message in a different form. For example, if the doctor uses a 1 in X statement, ask to hear that as a percent.*

- *Ask for a picture to represent risk – a shaded pie chart, for example.*

- *If the doctor explains the risk of a problem occurring, ask what the risk of things being O.K. is – eg, if there's a 40% chance that a drug won't work, then what is the likelihood that it will work?*

- *If the doctor talks about a change in risk – e.g., 30% decrease or 40% increase – ask what the risk is before the increase or decrease.*

- *Ask the doctor to show the risk on a probability scale like the one used in class.*

- *Ask the doctor to repeat, speak more slowly, or use simpler words.*

- *Tell the doctor what you have understood and ask if this is correct.*

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[8] List adapted from "Strategies to help patients understand risks" by John Paling. BMJ volume 327, September 2003. *Available at www.bmj.com*

Follow up activities

A. Probability and Health Risk Review Activity. Have students complete the Probability and Health Risk Review Activity, which follows this lesson plan, and return it to you as a check on their understanding of the material covered in the lesson.

B. Probability in the News. Ask students to look through newspapers and magazines to find expressions of probability and present them to the class – explaining what the issue is, how the probability is presented, alternatives for presenting it (e.g., percent, fraction, picture) and how the student views the risk involved – high, low, etc. E.g.,: A recent quote from Newsweek: 'If you smoke a pack a day for 20 years or more, you have a 50 percent chance of dying from smoke-related disease.'[9]

C. Research on Risk. Have students research the risks associated with a topic of their own interest such as a particular disease (e.g., diabetes) or an activity (e.g., smoking, sky diving).

Technology Tips

✓ **Presenting Risk with Visual Aids**
This website offers a useful introduction to the concept of risk via a moving visual presentation of risk. If you have a computer lab available to you and your students, this site might serve as an alternative introduction to this lesson.
https://www.besttreatments.org/risk

✓ **Risk Charts**
Particularly for GED students, you may wish to explore the website described below, which has links to a series of charts that show the risk of death due to cancer. The charts can provide practice in table reading skills as well as information for further discussion of risk.

Risk Charts: Putting Cancer in Context
Risk charts are simple, low-tech, visual tools that put disease risk into context. Schwartz and her colleagues have created examples of risk charts that show how many people out of 1000 will die of a particular disease within the next 10 years. There are separate charts for men and women, smokers and non-smokers, with risk data for people ages 20 to 90. The charts not only are appealing to look at, but also easy to understand. You can find examples and more information about risk charts at the Journal of the National Cancer Institute's Web site:
http://www.jncicancerspectrum.oupjournals.org/cgi/content/full/jnci;94/11/799?ij.

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[9] Statement by Dr. Norman Edelman, American Lung Association's chief medical officer. In "The Deadliest Cancer." *Newsweek*, August, 22, 2005, p. 44.

✓ **Risk Statistics**
This British website offers relevant statistical resources to support lessons or lectures –statistics of comparative risks and a variety of charts that present risk in different formats (tables, bar charts, etc.).
http://www.hse.gov.uk/education/statistics.htm#death

✓ **Manage My Health: Assess My Health Risks**
This website from Harvard Pilgrim Health Care provides links to a series of sites that allow a person to assess their health risk in multiple areas, including cardiac health, diabetes, cancer, stroke, osteoporosis, and more.
http://www.harvardpilgrim.org/portal/page?_pageid=213,38394&_dad=portal&_schema=PORTAL

✓ **Making sense of risk information on the Web**
Although the language used in this website may be a bit complex for your students, this website may serve as a useful resource for you as you guide your students in exploring and interpreting risk information on the web. The author suggests some useful pieces of information/questions to consider when reviewing risk information.
http://bmj.bmjjournals.com/cgi/content/full/327/7417/695

✓ **Exploring Risk Factors**
The on-line GED 2002 Teacher's Lesson Bank includes a lesson titled *Protect Your Heart* (Lesson 35), which covers a discussion of risk factors for heart disease and stroke, and provides students with practice in graphing and planning for healthy actions. Elements of the lesson can be adapted to pre-GED students. The lesson plan and materials are available at:
http://www.floridatechnet.org/ged/LessonPlans/Science/Science.htm

ESOL Tips

Students may benefit from practice in using the language of risk. You may want to ask them to role-play scenarios such as those included in the **Talking About Risk in Health Care Setting** activity. You may also want to include some discussion of how risk is perceived and discussed in other cultures. For example, do people openly discuss risks, especially those pertaining to health? Do doctors discuss risk in terms of numbers or in other ways?

Expressions of Probability

Complete the table below by filling in the missing values. Follow the example provided.

| Decimal	Percentage	Fraction	Chance/Odds
.10	10%	$\dfrac{10}{100} = \dfrac{1}{10}$	1 in 10
.30			
	75%		
		$\dfrac{1}{6}$	
			1 in 9
.05			
	.1%		
		$\dfrac{7}{8}$	
			9 in 10
	2%		

Talking About Risk in Healthcare Settings

1. Mario's father died of prostate cancer, so his doctor has told Mario that he is "at risk" of getting the disease too. What questions could Mario ask to more clearly understand his risk of getting the disease? Do you think Mario should be concerned about his risk of prostate cancer? Why?

2. Joyce goes to the doctor for a check-up. During the visit, her doctor tells Joyce that given her age, current health, and family history, she has a 1 in 200 chance of developing a certain type of cancer. Joyce has never heard this kind of information before and is confused by the numbers. What could she ask the doctor to do to make his message clearer? Do you think Joyce is at great risk of developing cancer? Why?
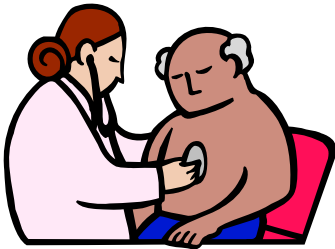
3. Simon has a problem with his heart and needs surgery. The doctor said that there's a 30% chance that the operation will not work. What questions could Simon ask to learn more about the risks involved in his surgery? Does Simon's surgery sound very risky to you? What would you advise him to do?

4. Elena has arthritis. Her doctor gave her a new medicine and said that there's a 60% chance that the medicine will help her. What questions can Elena ask to understand what this means? Do you think it's a good idea for Elena to take the medicine? Why?

Probability and Health Risk Review Activity

At her annual physical, Mrs. Sanchez's doctor tells her that her risk of developing a certain disease is about 1 in 50.

1. Mrs. Sanchez does not understand what this statistic (1 in 50) means. What are two questions that she might ask her doctor to help her better understand her situation/risk of getting this disease?

2. What is the probability of her getting the disease, expressed as a decimal and a percent?

3. Do you think Mrs. Sanchez is at a "high risk" for this disease? Why?

4. Once Mrs. Sanchez understands what 1 in 50 means, what other questions might she ask her doctor?