

Hanover Wellness Education News

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What is a healthy diet?

We turn to Dr. Walter Willett (2005), professor of epidemiology and nutrition and chairman of the department of nutrition at the Harvard School of Public Health and Dr. W. Allan Walker (2005), professor of pediatrics at the Harvard Medical School for the answer to this essential wellness question.

“You eat to live. It’s a simple obvious truth. You need food for the basics of everyday life - to pump blood, move muscles, think thoughts. But food can also help you live well and live longer. By making the right choices, you can avoid some of the things we think of as the inevitable penalties of growing older. A healthy diet teamed with regular exercise and not smoking can eliminate 80% of heart disease and the majority of cancer cases. Making poor choices – eating too much of the wrong kinds of food and too little of the right kinds, or too much food altogether – increases your chances of developing cancer, heart disease and diabetes. It contributes to digestive disorders and aging related loss of vision. It may influence Alzheimer’s disease. (Willett, 2005, p. 11)”

A delicious, satisfying diet based on whole grains, healthy oils, fruits, vegetables, and good sources of protein can help you stay healthy and active to an old age. Knowing what is good and what’s bad isn’t easy. The food industry spends billions each year to influence your choices. The media continually promotes the latest fad diets and serves contradictory nutrition information.

All fats are NOT bad. Trans fats (hydrogenated oils) and saturated fats contribute to coronary artery disease, stroke and other problems. Saturated fats are found in whole milk, cheese and red meat. Trans fats (look for partially hydrogenated or hydrogenated oils on ingredients lists) can be found in hard margarines, vegetable shortenings, bakery goods and fried foods in restaurants. Monounsaturated and polyunsaturated fats found in olive oil and other vegetable oils, nuts, whole grains and fish are good for you especially when you eat them in place of artery clogging saturated and trans fats (Willett, 2005).

Rapidly digested carbohydrates such as white bread, potatoes, pasta and white rice causes a fast, high spike in blood sugar followed by an equally fast fall. This blood sugar roller coaster – and the insulin one that shadows it – triggers the early return of hunger. This process is part of the path to heart disease and diabetes. It also raises levels of triglycerides and lowers protective HDL (good) cholesterol. The effects of these rapidly digested carbohydrates are a serious consequence for people who are overweight (Willett, 2005).

The carbohydrates in **whole grains and legumes**, such as oats, brown rice, quinoa, whole wheat pasta, beans and whole wheat bread have a slow, low and steady effect on blood sugar and insulin levels. This helps you feel full longer and keeps you from getting hungry right away. These slowly digested carbohydrates give you essential fiber, vitamins, minerals and protect against heart disease and diabetes. These are the foundation of a healthy diet (Willett, 2005).

You need protein every day. You can get it from a variety of foods. Red meat is a poor protein package because of its saturated fat and cholesterol content. Chicken, fish and turkey provide less saturated fat. Fish also provides some essential unsaturated fats. Legumes (e.g. lentils, garbanzo, navy and black beans) and nuts give you fiber, vitamins, minerals, healthy unsaturated fats and phytochemicals (plant products that protect against a variety of chronic diseases). The best sources of proteins are beans, nuts, fish, poultry and eggs (Willett, 2005).

You need calcium (not necessarily from dairy products). The recommended amount of calcium and whether or not we need to drink cow’s milk has been widely debated (Willett, 2005; Nestle, 2006; PCRM, 2006; and Walker, 2005). Americans calcium intakes are among the highest in the world. Yet, we have one of the

highest rates of hip fracture. Dr. Willett believes that if are looking for calcium there are cheaper, easier and healthier ways to get it than dairy products. Willett recommends cereals, yogurt, tofu, leafy green vegetables and orange juice.

Marion Nestle a professor of food science at New York University (2006) states that cows do not drink milk after calthood. They grow bones that support 800+ pounds on a grass diet. Grass has calcium, and so do fruits, vegetables, grains, beans and nuts. In parts of the world where cow's milk is not a staple of the diet, people have less osteoporosis and fewer bone fractures than Americans do with less than half of our recommended calcium intake. Only about a quarter of the world's adults can fully digest milk. Drinking milk for 50% of Hispanic Americans, 75% of African Americans, and more than 90% of Asian Americans will result in nausea, bloating, diarrhea and cramps. Further, whole milk, ice cream and many cheeses are high in artery clogging saturated fats. Today's milk also contains more concentrated amounts of hormones than it did years ago (Willett, 2005). Conversely, Dr. Walker states that milk can play a big role in a child's diet.

Your body contains about 2 pounds of calcium, about 99% of which is locked into bone. Think of calcium as the mortar that cements and solidifies the components that give bone its substance and strength. The rest is dissolved in your blood and the fluid inside and outside your cells. That dissolved calcium helps conduct nerve impulses, regulates your heartbeat, and controls other cell functions (Willett, 2005).

Many factors influence bone remodeling and bone health

Your body constantly builds up and breaks down bone. Early in life, building dominates. Throughout midlife the two processes balance one another. Later, demolition may outpace building and lead to weak or broken bones. One of the most important ways to promote bone health is weight bearing physical activity and progressive resistance training (strength training). Putting a bone under repeated stress (such as the stress of progressive resistance exercise or simply walking) triggers growth. Lack of stress (little or no physical activity) leads to degeneration. The hormones estrogen and testosterone stimulate bone building activity during puberty and set off an adolescent's growth spurt. The loss of these sex hormones later in life (gradually for men and often abruptly for women) shifts the balance toward bone loss. The amount of calcium available to bone building influences bone remodeling, as do the amounts of vitamin D and vitamin K (Willett, 2005).

Eating plenty of fruits and vegetables (eating white potatoes sparingly) helps lower blood pressure, decreases heart attack and stroke risk, protects against some cancers, guards against digestive disorders and limits the likelihood of losing your vision as you age (Willett, 2005).

More than two hundred studies have shown that people who eat plenty of fruits and vegetables decrease their chances of having heart attacks and strokes, of developing certain cancers, or of suffering from digestive problems. White potatoes do NOT contribute to these benefits (Willett, 2005)

Water must be constantly replaced in order to keep our bodies functioning optimally. When children lose more water than they take in they can become dehydrated which can result in minor headaches, fatigue or potentially life threatening illness. Water is the best option to provide daily hydration for children without clogging their diet with a lot of sweeteners (see table below). The American Academy of Pediatrics recommends that children ages 1-6 drink no more than 4-6 ounce of fruit juice per day while those 7-18-years-old should drink no more than 8-12 ounces of fruit juice per day. A child who consumes adequate fruits and vegetables does not need juice (Walker, 2005).

Achieving and maintaining a healthy weight is essential. The lower and more stable your weight, the lower your chances of having or dying from a heart attack, stroke, or other form of cardiovascular disease; of developing high blood pressure, high cholesterol, or diabetes; of being diagnosed with postmenopausal breast cancer, cancer of the endometrium, colon or kidney (Willett, 2005).

How much water do we need?

	Age	Total water Liters per day
Children	4-8	1.7
Male	9-13	2.4
	14-18	3.3
	19- >70	3.7
Female	9-13	2.1
	14-18	2.3
	19- >70	2.7

These numbers represent adequate intakes. Total water includes all water contained in food, beverages and drinking water. Environment and physical activity may require increased water intake.
(Food and Nutrition Board, Institute of Medicine of the Nation Academy of Sciences, 2005)

This information is not meant to take the place of the advice you get from your health care provider and or physician, especially if you have a medical condition that requires a specific diet.

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What is physical fitness?

Unfortunately, we live in a society that is causing us all to adopt and maintain sedentary lifestyles. We live in an era of overweight, obesity, junk food, super-sizing, overeating, unbalanced diets, addiction to screen based media (TV, video, video games, and computers – see March - 2007, Hanover Wellness Education News), and over reliance on labor saving devices. Physical education is the only place where students are equipped with the knowledge, understanding, behaviors and skills necessary to adopt and maintain a physically active lifestyle. A constant focus of physical education is health related physical fitness. This month's issue of the wellness education news will focus on health related physical fitness.

Physical fitness is a state of well being that: allows you to perform daily activities with full energy and respond to emergencies when necessary; reduces the risk of chronic diseases and other health problems related to lack of exercise; helps maintain optimal functioning of body systems; and establishes a sound base for participation in a variety of physical activities. Physical fitness can also be described as a set of physical attributes that people have or achieve relating to their ability to demonstrate physical activity.

There are five components of health related fitness: cardio-respiratory fitness, muscular strength, muscular endurance, flexibility and body composition. Having a moderate amount of each component of is essential to disease prevention and health. It is not essential to have extremely high levels of fitness to attain health benefits. High levels of health related fitness relate more to performance (in sport or work) than health benefits.

1. Cardio-respiratory fitness is the ability of the heart, blood vessels, blood and respiratory system to supply fuel and oxygen to the muscles and the ability of the muscles to utilize fuel to allow sustained exercise. A fit person can persist in physical activity for relatively long periods of time. Cardio-respiratory fitness has many synonyms such as cardio-respiratory endurance, cardiovascular endurance, cardiovascular endurance, aerobic fitness, aerobic endurance and aerobic capacity. We prefer the term cardio-respiratory endurance because it represents the cardiovascular system and respiratory system working together.

Cardio-respiratory fitness requires a healthy heart muscle. The heart is a muscle and for it to become stronger it must be exercised regularly like any other muscle in the body. If your heart receives regular exercise it will become stronger. If it does not receive regular exercise it will become weaker. A stronger heart can pump a greater volume of blood with fewer strokes per minute. The heart of a normal person beats about 40 million times a year and circulates about ten tons of blood each day. Some physical activities that promote cardio-respiratory endurance include: jogging, running, bicycling, swimming, dancing, jumping rope and skating.

2. Muscular strength is the ability of the muscles to exert an external force or to lift a heavy weight. A fit person can do work or play that involves exerting force, such as lifting or controlling one's own body weight.

3. Muscular endurance is the ability of the muscles to exert themselves repeatedly. A fit person can repeat movements for a long period of time. Because of the integrated status of muscular strength and muscular endurance they are often referred to simply as muscle fitness.

Progressive resistance training (PRT – also called progressive resistance exercise or strength training) is doing exercise against a resistance. PRT provides stress on the bones and promotes muscle fitness. Together with good diet, including adequate calcium and vitamin D intake, this stress on the bones reduces the risk of osteoporosis. PRT can improve bone density (also known as peak bone mass). As we age bone mass decreases. People who have a high bone density when they are young have higher levels of bone mass density from which to draw from as they age (Corbin et al, 2004). PRT increases one's ability to exert or resist force. Free weights, body weight, machines, or other devices (elastic bands, tubing) can provide resistance. Strength training is an essential part of all fitness programs. It can assist in increasing motor skill, fitness and injury prevention. PRT is a sequential and progressive method for exercising with a developmentally appropriate resistance that can be increased gradually.

Improved muscle fitness can provide: greater musculoskeletal strength; stronger tendons and ligaments; greater bone mass density; improved body composition; increased metabolic rate – burning of more calories during and after exercise; decreased chance of muscle injury; reduced risk of muscular imbalance and overuse injuries; reduced risk of lower back problems; better posture; more efficient physical activity and sport performance; greater work capacity; quicker recovery after vigorous physical activity; improved ability to meet emergencies; and improved self esteem and confidence.

PRT is appropriate and safe for ALL individuals if the equipment, program and supervision are appropriately matched to the person. Competitive weight lifting, maximal lifts and body building are to be AVOIDED by children and adolescents. Careful and proper observation, instruction and supervision are the most important elements in quality muscle fitness exercise for children. Wayne Westcott of the Quincy YMCA has conducted hundreds of strength training programs with children and adolescents between the ages of 6 and 15 for over fifteen years without a single training related injury (Faigenbaum and Westcott, 2000).

4. Flexibility is a measure of the range of motion available at a joint or group of joints. Flexibility and stretching are an important part of every workout. Flexibility is determined by the shape of the bones and cartilage in the joint, and by the length and extensibility of muscles, tendons and ligaments that go across the joint (Corbin et al, 2004). A fit person can move their body joints through a full range of motion. Flexibility is not the same thing as stretching. Stretching is the major technique used to improve flexibility. Flexibility is rapidly lost without training. Stretching should be performed at least three times per week, preferably daily or after all vigorous physical activity.

5. Body composition is the relative percentage of muscle, fat, bone and other tissues of the body. A fit person has a relatively low percentage of body fat. Body composition is the final component of health related fitness. It is unlike the other components since it is not a performance measure and requires no movement.

Every person should possess at least a small amount of essential fat for good health. Essential fat is necessary for temperature regulation, shock absorption and regulation of essential body nutrients. Nonessential fat is fat, above the essential fat levels that accumulates when we take in more calories than we expend. When there is excessive amounts of nonessential fat, overfatness can occur. A desirable range of fatness is associated with good health and wellness. Overweight and obesity result from an imbalance involving caloric consumption and or insufficient physical activity. A person's body weight is the result of a combination of genetic, metabolic, behavioral, environmental, cultural and socioeconomic factors.

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SCREEN MEDIA TURNOFF WEEK

"Given our national television habit, it is no surprise that we are raising the most sedentary and most overweight generation of youngsters in American history. As they grow, these children will run increased risks of heart disease, diabetes, and other health problems – unless they turn off the tube and become physically active." Former U.S. Surgeon General, David Satcher, M.D., PhD.

In order to recapture time for: meaningful physical activity, reading, eating dinner together as a family, music, art, playing imaginatively, working on essential skills that require practice in order to demonstrate competency and enjoying life, we offer you the opportunity to take the screen based media challenge. This week long "turnoff" asks you to sacrifice or reduce the amount of time that you spend: watching television: DVD's, movies and videos; playing video games and engaged in the recreational use of the computer. The second half of this challenge asks you to replace this lost screen time with reading and physical activity. Recreational screen based media often replaces activities that we know helps children and adolescents perform better in school such as reading, writing, doing homework, practicing essential skills, eating healthy food and getting adequate sleep. Turnoff week will begin on Sunday, March 25, 2007 at midnight, and end on Sunday, April 1, at midnight (see instructions below). 2007 marks the 6th year that Cedar School students will have (voluntarily) participated in the Screen Media Turnoff Week.

Why should I cut back on my screen based media time?

"Family is the most important influence in a child's life, but television is not far behind. Television can inform, entertain, and teach us. However, some of what TV teaches may not be the things you want your child to learn. TV programs and commercials often includes violence, alcohol or drug use, junk food marketing and sexual content that may not be suitable for children or teens. Studies show that TV viewing may lead to more aggressive behavior and less physical activity. By knowing how television affects your children and by setting limits, you can make your child's TV watching experience not only enjoyable, but healthy too (AAP, 2006)".

A study by the Kaiser Family Foundation (2005) and Stanford University found that children 8-18-years-old averaged 3:51 hours of TV viewing per day; 1:02 hours of computer use per day; and 49 minutes playing video games per day. 68% of these children reported having a television in their bedroom. 49% of these children reported having a video game player in their bedroom. Further, the average 13 to 19-year-old spends 9.5 hours each day sitting (Harris, 2003). Scroll down for more facts about TV, video games and the recreational use of screen based media.

WHAT IS THE CHALLENGE? HOW DO I DO IT?

Turnoff week begins when you wake up on Monday morning, March 26 and ends when you go to bed on Sunday, April 1st. All Hanover Students, staff, parents, caregivers and community members are invited to give it a try.

Part 1: Set your goal. Choose your level of commitment by circling level one, two, three or four for the time you will spend: using screen media, being physically active and reading. You may choose a different level for each aspect of the challenge.

Level of Commitment	Hours spent Engaged in Recreational screen Based media	Hours spent engaged In physical activity	Hours spent reading or Being read to
Level 4	0	Greater than or equal to 14	Greater than or equal to 7
Level 3	Less than 2	Greater than or equal to 12	Greater than or equal to 5
Level 2	Less than 4	Greater than or equal to 10	Greater than or equal to 4
Level 1	Less than 7	Greater than or equal to 7	Greater than or equal to 3

The screen based media that we ask you to limit or sacrifice includes:

1. Watching television, movies, DVD's and video
2. Playing video games
3. Using a computer for a non-educational/recreational purpose such as playing a video game

Note on computer use: Reading online (at a website like www.nytimes.com) would be an acceptable use of time. Using a computer for research, writing/typing and composing an email would also be acceptable (educational). We defer to you, the parent or caregiver, to identify non educational/recreational computer time

Part 2: Participate in enjoyable physical activity

Physical activity includes any moderate to vigorous physical activity that you will enjoy doing such as walking, jogging, cycling, swimming, exercise, playing a sport, dancing, gymnastics, strength training, stretching and so forth. Aim for at least one hour of enjoyable physical activity every day.

Part 3: Read

Try to read at least 30 minutes each day. This can include the newspaper (on line or in print), a magazine, picture book chapter book and or comic book. Younger children can ask a caregiver to read to them.

Part 4: Record your progress on the table below

	Monday 3/26	Tuesday 3/27	Wednesday 3/28	Thursday 3/29	Friday 3/30	Saturday 3/31	Sunday 4/1	Total Time
Screen Time								
Physical Activity Time								
Reading Time								

THE FOLLOWING THINGS TO CONSIDER CAN HELP YOU ENJOY YOUR WEEK

Identify some reasons why it is important for you to achieve your goal of eliminating or reducing screen based media time. It will give me more time to spend: with my family, reading, exercising, playing, doing school work...

Identify obstacles that might keep you from avoiding recreational screen based media: other people in the house watching TV, bad weather might prevent outside activity, boredom, feeling tired.

Identify physical activities that you enjoy doing. Playing sports, dancing, going for a walk, exercising, playing games with family and or friends.

Identify books and periodicals that you would enjoy reading (or having read to you). Picture books, chapter books, newspaper, magazine, comic book.

Identify friends or family members who will support you. Father, mother, brother, sister, friend, grandmother, grandfather.

Celebrate your success. You could celebrate a job well done by having a party for yourself, reading a book, or doing a favorite physical activity .

TELEVISION: STATISTICS AND FINDINGS

TELEVISION AND PRE-SCHOOL CHILDREN

- **The American Academy of Pediatrics (AAP, 2006) recommends no more than 1 to 2 hours of educational, nonviolent TV viewing per day for children older than 2. The AAP does not recommend television for children age 2 or younger.**
- Children of all ages are constantly learning new things. The first two years of life are especially important in the growth and development of your child's brain. During this time, children need good, positive interaction with other children and adults. Too much television can negatively affect early brain development. This is especially true at younger ages, when learning to talk and play with others is so important – American Academy of Pediatrics (AAP, 2006).
- Researchers at Children's hospital in Seattle (Howard, 2006) concluded that any television (educational or non education) programming during the first two years of life affects the "hard wiring" of the brain.
- In the U.S., preschoolers average 1 hour of TV viewing per day. School age children average 3 hours (Howard, 2006)
- Infants and toddlers who watch TV often have irregular sleep patterns (Thompson & Christakis, 2005)

HOW MUCH TIME DO WE SPEND WATCHING TELEVISION

- The U.S. census bureau (2004) projected that the average American adult watched 1,669 hours of television in 2004. This is the equivalent of about 4.5 hours of television viewing per day and 70 full days of television watching over the course of one year. **If someone watched television for an average of 4.5 hours per day over the course of 65 years they would have watched television for a total of about 12.5 years.**

- The total number of hours that the average child will spend watching television during their school age years will be greater than the number of hours they spend in school from kindergarten through grade twelve (Dietz, 2001).

TELEVISION AND CHILDHOOD OVERWEIGHT AND OBESITY

- **The prevalence of overweight has been shown consistently to be directly related to the amount of time children and adolescents spend watching TV. Reductions in television (and all screen based media) appear to be effective strategies to treat and prevent overweight** (USDA, nutrition and your health, 2005).
- While watching TV, the metabolic rate goes even lower than it does while the body is at rest. This means that a person would burn fewer calories while watching TV than when just sitting quietly, doing nothing (Klesges et al, 1993)

TELEVISION VIOLENCE

- Two thirds of all TV programming contains violence (Federman, 1998).
- Programs designed for children more often contain more violence than adult TV (Federman, 1998).
- Most violent acts go unpunished on TV and are often accompanied by humor. The consequence of human suffering and loss are rarely depicted. Many TV shows glamorize violence. TV often promotes violent acts as a fun and effective way to get what you want, without consequences (Federman, 1998).
- Children imitate the violence they see on TV. Children under age 8 cannot tell the difference between reality and fantasy, making them more vulnerable to learning from and adopting as reality the violence they see on TV (AAP, 2001).

TELEVISION, ALCOHOL, AND TOBACCO

- Exposure to alcohol use on TV and in music videos is a risk factor for increased drinking in adolescents (Robinson et al, 1998)
- Ads for alcohol portray people as being happier and more successful when they drink. Alcohol advertising, including TV ads, contributes to increased drinking among youth (Snyder et al, 2006)
- Kids who watch more TV start smoking at an earlier age. The relationship between television viewing and age of starting smoking was stronger than that of peer smoking, parental smoking, and gender (Gutschoven and Van den Bulck, 2005)

TELEVISION ADVERTISING – the statistical association between ad viewing and obesity is strong Institute of Medicine (2005)

The average child watches between 20,000 and 40,000 television commercials each year (Simon, 2006) most of which are for junk food. Kristen Harrison, a professor of speech communication at the University of Illinois at Urbana-Champaign has researched how marketing contributes to children's confusion about nutrition. Harrison states, "Child television viewers are bombarded with health claims in television advertising. Given the plentitude of advertisements on television touting the health benefits of even the most nutritionally bankrupt of foods, child viewers are likely to become confused about which foods are in fact healthy. Television in general seems to be a source of nutritional misinformation" (University of Illinois, 2005). Young children (age 8 and under) have not yet developed the cognitive ability to even realize they are being marketed to. They cannot understand what's called "persuasive intent." Older children usually understand what advertising is, they often lack the cognitive capacity to resist it. Interestingly, some countries have banned television advertising aimed at children. In Ireland, all television commercials for fast food and candy are banned (Simon, 2006).

VIDEO GAMES: STATISTICS AND FINDINGS

- Video games are played on several platforms: home consoles used with TV sets, computers, computers with internet access, coin operated arcade machines, and handheld game systems, cell phones and palm pilots.
- 92% of those ages 2-17 play video games (KFF, 2002).
- Almost half of "heavy gamers" are 6 to 17-years-old (Walsh et al, 2006)
- A study of 1,000 5th, 8th and 11th grade students found that 8th grade boys average 23 hours of video game play each week (MSU, 2004)
- Children who spend more time playing video games are more likely to be classified as overweight or obese. (Walsh et al, 2006)
- The amount of time kids spend playing video games is correlated with poorer grades in school and attention problems. (Walsh et al, 2006)
- The amount of time playing video games varies by age: 2-7-year-olds average 8 minutes per day; 8-13-year-olds average 32 minutes per day; 14-18-year-olds average 20 minutes per day. Boys spend substantially more time playing video games than girls do, regardless of age. Boys 8-13-years of age average 47 minutes per day playing video games (KFF, 2002)

- A meta analysis of 35 studies on 4,000 participants found that playing violent video games increased feelings of anger and or hostility and decreased prosocial (helping and caring) behavior (KFF, 2002)

INTERNET: “Advergaming”

Advergaming is a way many big food companies market foods of minimal nutritional value to children. Here advertisements are built into free video games on children’s web sites. These web games promote cookies, chips, sugary breakfast cereals, cheese that is sprayed from a can and salty “boxed lunches”. One game “comes to the rescue” of children who have been sent to school by mom with a homemade lunch. The average amount of time a child spends on an “advergaming” web site is 26 minutes (Simon, 2006).

SCREEN BASED MEDIA: STATISTICS AND FINDINGS

- Obesity in children increases the more hours they use screen based media. The incidence of obesity increased 2% for every additional hour of TV watched (Crespo et al, 2001; Vandewater, et al, 2004; Anderson et al, 1998; Gortmaker et al 1996; Dietz & Gortmaker, 1985; and Janz et al, 2001).
- Researchers at Stanford University established a 7 hour weekly limit for television and video game time. This 7 hour group demonstrated a significant reduction in measures of obesity (Robinson et al, 1999).
- Children age 8-18 spend 44.5 hours per week in front of a computer, television and game screens. They spend more time engaged in screen based media than any other activity in their lives except sleeping (Kaiser Family Foundation, 2005).
- Children 6 and under spend an average of two hours a day using screen (TV, VCR, DVD, Computer, video games) media (KFF, 2003).
- Media violence can contribute to aggressive behavior, desensitization to violence, nightmares, and fear of being harmed (AAP, 2001)

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HANOVER WELLNESS EDUCATION NEWS

April, 2007

<http://www.hanoverschools.org/wellness/index.htm>

WHAT MOTIVATES YOU?

Over the next three issues of the Hanover wellness education news we will explore the question – What make us do what we do? In April we will examine how rewards can punish. Where does motivation come from? - will be the focus of the May news. June will offer a framework for achieving goals.

We want results. We want high test scores. We want profits. We want to win. Many of us are driven by: the fear of a poor result on the next test; failure to meet a sales quota; failure to achieve what is expected of us by others; or the disapproval of a superior. While we are struggling against stressors and the pressures of life some act irresponsibly. Violence or “acting out” is becoming commonplace in America. Some respond to this by wanting to crack down, achieve discipline, and make those around them behave better. We want to control. The more pressure we feel the more likely we are to use controlling behaviors. Control is an easy answer. It assumes that the promise of a reward or the threat of punishment will force compliance. When we control we are usually not concerned with whether or not participants are interested in or enjoy what we ask them to do.

Psychologists believe (Deci & Ryan, 2002; Dweck, 2006) we should focus on the motivation underlying the irresponsibility rather than controlling others. They recommend we focus on autonomous (self governing) behavior. Those who are autonomous are fully willing to do and embrace what they do with interest and commitment. Their actions come from a true sense of self. These people are the captains of their own ship. Conversely, when we are controlled we act without a sense of personal endorsement. Here, our behavior is not an expression of the true self.

There are two types of controlled behavior. The first is **compliance** – doing what you are told to do because you are told to do it. The second is **defiance** – to do the opposite of what you are expected to do just because you are expected to do it. Some people are highly compliant. Others will defy all the demands of authorities. Those who study behavior (Deci & Ryan, 2002) believe that the price of compliance is high. When we think we have to do something rather than choosing to do something we are not in control of our life.

Controlling environments demand, pressure, prod and cajole people to behave, think or feel in certain ways. Controlling environments get people focused on trying to please others rather than finding out what is right for them. Compliance produces change that is not likely to be maintained. Defiance blocks change. Meaningful change occurs when people accept themselves, take interest in why they do what they do and then decide that they are ready to behave differently (Deci, 1996).

Behaviorism - Do this and you'll get that – is not as simple as that

Alfie Kohn (2001) rocked the education world with his book – Punished by Rewards in 1993. Kohn tells us that many people believe the best way to get something done is to provide a reward to someone when they act the way we want them to. American schools use behavior modification programs, rewards, grades, gold stars and other incentives to reward compliance. We believe that you should deliver a reward for a specific, identifiable, behavior as soon after the compliant behavior as possible. Further, we stress a focus on the reward over the punishment and are consistent in delivering the rewards (this practice is a foundation of psychological behaviorism [Skinner, 1953]).

The belief that “the larger the incentive, the greater the motivation” is called the maximal-operant principle of motivation (Deci & Ryan, 2002). Many believe that an absence of motivation is best countered by the presence of an incentive. The wisdom of this practice is rarely held up for inspection. We only question what the “doer” will receive and under circumstances it will be promised and delivered. Many believe that this is THE way to teach and manage people. People in one up positions (parents, teachers and bosses)

promise candy to the girl who remains peaceful and quiet in the car; hold up an A as an incentive to perform in schools; and offer a tropical vacation to the employee who exceeds a sales quota. This is the American way. We are deeply committed to this way of thinking and behaving. Kohn maintains that rewards lead to poor quality work and an eventual loss of performance interest. Further, Kohn and others (Deci, 1996; Deci & Ryan, 2002; Dweck, 2000) believe that when the rewards go away children and adults lose interest in a given activity and do not perform as well. Rewards and punishments undermine intrinsic motivation and contact with our inner selves.

The message behind behaviorism (Deci, 1996) is that people are passive and will respond only when the environment tempts them with the opportunity to get rewards or avoid punishments. Further, this view assumes people will do as little as they can get away with. This theory is not congruent with the belief that children and adolescents are inherently motivated to learn and achieve.

Punished by the reward

Rewards often draw people's attention away from the task itself. When we are oriented toward rewards we will take the shortest and easiest path to get there. A pizza franchise once offered a program where students earned points for reading books which they redeemed for pizzas. The message for many of these students was – eating a pizza is more enjoyable than reading a book. Many educators believe that programs such as this cause students to skim through books while racing toward the reward. Practices like this ultimately reduce interest in reading and learning. How many of these students continued to read when the pizzas went away (Deci, 1996)?

Many educators believe that students are motivated to learn by the reward of high grades or test scores. A large body of research (Deci, 1996; Deci & Ryan, 2002) has shown that when students learn something in order to put the information to use (such as teaching it to others) they demonstrate a greater understanding of the material than do students who learn simply to be tested. When preparing for tests many students simply focus on simple rote memorization (simply giving back information that was taught). They process information at a superficial level and don't truly understand the overarching concepts (big ideas) that lie behind the information. Further, most who memorize information to recall and recognize it on a test forget it within a few days (in computer jargon this is known as a core dump).

Driven by Curiosity and the need to feel competent

When a student is driven by curiosity and interest she is intrinsically motivated to learn. This student has a richer learning experience, better conceptual understanding, greater creativity and improved problem solving. Psychologists have long believed (White, 1959; Deci & Ryan, 2002) that people yearn to become competent and engage in learning to expand their own sense of accomplishment. The curiosity of children and their motivation to learn can be attributed to their need to feel competent and to meet optimal challenges (being able to do trivial tasks well on the first try does not lead to perceived competence). Perceived competence supports intrinsic motivation. Finally, behavioral experts (Deci & Ryan, 2002) believe that rewards, deadlines, evaluations and grades undermine our intrinsic motivation.

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HANOVER WELLNESS EDUCATION NEWS

May, 2007

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“He who knows others is wise. He who knows himself is enlightened.” Lao Tzu

Where does motivation come from?

Many think the best type of motivation comes from external control such as the larger than life coach who coddles, urges, shames and encourages turning the meek into the bold or the orderly office that results from the boss who carefully uses rewards, praise and punishments to turn employees into compliant workers. However, experts in human behavior believe (Deci & Ryan, 2002; Dweck, 2006) that self motivation is at the heart of creativity, responsibility, healthy behavior and enduring learning. External controls can bring about short term compliance and long term negative consequences. This could include an urge to defy and a diminished connection with the true self.

THERE ARE TWO TYPES OF MOTIVATION INTRINSIC AND EXTRINSIC.

INTRINSIC MOTIVATION (characterized by autonomy and proactive behavior).

When we engage in an activity freely without being rewarded and find it highly interesting and enjoyable we are intrinsically motivated. When we expect a reward for performing a task our intrinsic motivation (IM) is undermined. To be intrinsically motivated people need to perceive themselves as competent and autonomous. True sense begins with the intrinsic self. The intrinsic self is a set of potentials, interests and capabilities that interacts with the world. Each aspect of the intrinsic self interacts with the others. A sense of self is the developmental outcome of this interactive relationship. A person's intrinsic needs include: autonomy, competence and relatedness. When these needs are not met the result is poor mental health (Deci, 1996). Behavior experts (Ryan, 1982; Deci & Ryan, 2002) recommend that we should be propelled by curiosity, interest and intrinsic motivation.

Set limits

Being oneself also involves accepting responsibility for the well being of others (caring). It is important to remember that when we support the autonomy of a child we are not being permissive. We must understand what a child is feeling and needing while setting clear limits and administering consequences. This is the path to appropriate behavior and to the child becoming better self regulated (Deci, 1996).

EXTRINSIC MOTIVATION (characterized by external control and reactive behaviors).

Extrinsically motivated behaviors refer to a broad array of behaviors that are NOT engaged in for the enjoyment or interest of the activity itself (Deci & Ryan, 2002). A continuum exists from a high level of extrinsic motivation (EM or self determination) to perform a task to a low level of extrinsic motivation. Here are some examples from this continuum beginning with full external control –

1. We perform tasks only to attain monetary rewards or to avoid reprimands (person is externally controlled). Motivation comes from and depends solely upon rewards, pressure or constraints
2. I should vote in the election so I will feel like a participant in democracy (beginning of internal or self regulation). Here, we take in but do not truly accept others rules or demands to think, feel or behave in certain ways. In this example, the demands of society regulate behavior.
3. I will read this book because knowing its message will get me closer to an important goal of mine. This person accepts the merits of a belief or behavior because he or she sees its importance.
4. A novice carpenter who reluctantly accepts a job for a family friend may value doing the job well more for the family friend than he does from a desire within his true self (highest level of self determination – but not true intrinsic motivation).

IMPLICATIONS OF CONTROL AND EXTRINSIC MOTIVATION

Competition

We often use controlling feedback and rewards in competitive sport in order to improve performance. Behavioral experts suggest that we use competition to provide challenge. We should provide athletes the opportunity to test themselves and to improve within an enjoyable environment. In sport, for example, we often identify the person who finished second as the “first loser” or second best instead of recognizing his/her effort, motivation and achievement. We value winning more than performing well or being a good sport. Competitive sport frequently emphasizes social comparison, evaluation and “weeding out” (Labaree, 1997)

Engagement in learning

Engagement refers to the intensity and emotional quality of involvement during learning (Deci & Ryan, 2002). Engaged students demonstrate a high level of effort and a positive attitude toward learning. When a learner is engaged she exhibits the following behaviors: attention, effort, participation and persistence. He demonstrates the following emotions during learning: interest, enjoyment or happiness, enthusiasm and a lack of anxiety. In contrast, disaffection means a student will withhold effort, give up easily, do just enough to get by, feel burdened or pressured when they do try and experience anxiety or anger.

What is amotivation?

Amotivation is present when we display an absence of motivation (Deci & Ryan, 2002). Here, we do not see a relationship between behavior and outcomes so we do not act to attain a result. Amotivated people feel incompetent and act like they have little control. For example, an amotivated student cannot see what staying in school will bring to them, so she drops out.

MOTIVATION MANIFESTS ITSELF IN DIFFERENT WAYS (Ryan, 1982)

1. Ego Involvement

An ego involved person's feelings of worth depend on performance. This person does an activity to prove to themselves that they are good at the activity and thus a worthy individual. We are ego involved for example, when our feelings of worth depend only upon accumulating large amounts of money or when our feelings of worth depend upon winning a competition. Ego involvement undermines intrinsic motivation. Those who are ego involved report more pressure, stress and anxiety about performance. They worry about appearing a certain way to others so they can feel good about themselves (Ryan, 1982).

2. Task Involvement

Task involved people are more involved with and motivated by the task itself rather than with its implications for their own feelings worth (Ryan, 1982).

HOW CAN WE SUPPORT A PERSON'S AUTONOMY AND DEVELOP INTRINSIC MOTIVATION?

1. Provide choice

Providing choice within limits is important. When we provide students choice we support the child's intrinsic motivation and autonomy. Meaningful choice supports the child's willingness to perform because the child is empowered and fully endorses what they are doing. The opposite of a controlling style is supporting a person's autonomy. This means taking another person's perspective, encouraging self-initiation, experimentation and self-responsibility. This means support through encouragement and positive feedback.

2. Provide feedback

“I am here as a witness to describe, not as a judge to evaluate.” Elie Wiesel.

Often our praise is contingent upon doing something such as getting an A on the test, finishing a meal, or cleaning the house. The hidden message is that you would not be worthy if you had not hit your target. Praise should be non-contingent and positive (Rogers, 1951). In any evaluative process when performance falls short of a standard, we should not view the situation as a basis for criticism but as a problem to be solved (Deci, 1996).

Psychologists and experts in human behavior (Dweck, 2000, 2006; Deci & Flaste, 1996; Ryan, 1982; and Deci and Ryan, 2002) offer suggestions on how can we support another's autonomy and develop intrinsic motivation.

1. Share your one up position. Build an alliance with your students, children, or employees. Allow people to play an appropriate role in decision making and making choices.
2. Take the perspective of another. Try to understand what they want, why they do and what they do.
3. Make empathetic perspective taking statements and acknowledge feelings
4. Encourage others to take initiative and create new ideas.
5. Value and support the autonomy of others and how we each learn, think and work in unique ways
6. Encourage people (students) to solve their own problems
7. Be flexible and give people time to work in their own way
8. Spend more time listening
9. Give children more time for independent play or work
10. Praise effort and problem solving (do not solve problems for students)
11. Greet people and ask them how they are feeling
12. Provide rationales for why a task is important to a participant's (such as a student's) well being although if it may seem uninteresting to others
13. Provide clear expectations and optimal challenges (that meet the person at his/her level)
14. Establish an interpersonal relationship that emphasizes choice and flexibility rather than control and pressure

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HANOVER WELLNESS EDUCATION NEWS

June, 2007

<http://www.hanoverschools.org/wellness/index.htm>

A FRAMEWORK FOR ACHIEVING A GOAL

“Be not afraid of growing slowly. Be afraid of standing still.” Chinese proverb

When people feel competent enough to achieve a desired outcome (Deci, 1996) they are more likely to set their own goals, develop their own standards, monitor their own progress and attain goals. Goals need to be individualized and represent an optimal challenge. If goals have been properly set, they can represent the standard against which performance is evaluated. When students set their own goals they should also participate in evaluating their efforts toward those goals.

When people fully endorse a change there is a relaxed type of commitment that reflects a deep personal choice to change. At this time, we behave autonomously and have a higher probability of achieving a goal or making a change. Some negative behaviors such as smoking or overeating serve to bind anxiety and provide an escape from pressures or provide comfort. These behaviors serve many different purposes and make us resistant to change. To be ready to change self destructive behaviors we have to reach the point where we are willing to allow and deal with the feelings that the behaviors are blocking. When we are ready to accept responsibility for our behavior and health – when we are ready to make a deep personal commitment and to accept the uncomfortable feelings that may accompany change – our efforts to change are likely to be successful. We must confront underlying motivations that promote self destructive behavior so that they do not “control” us (Deci, 1996).

We are ready to change when we are ready to cope with the anxiety, inadequacy, rage, terror or loneliness that underlies our maladaptive behaviors. Motivation must come from within. It comes from deciding we are ready to take responsibility for managing ourselves (Deci, 1996).

HOW CAN I CHANGE AN UNHEALTHY BEHAVIOR?

“Well begun is half done.” Aristotle

Making healthy changes is easier said than done. Even with high levels of intrinsic motivation, adopting a healthy habit or breaking an old negative one can be difficult. Experts who study long lasting change believe success is most likely when it is intrinsically motivated and rooted in positive thinking (Harvard Medical School, 2007).

“A goal without a plan is just a wish.” Antoine de Saint Exupery

Many health professionals recommend that anyone wishing to reach a goal use the acronym **SMART**. This means our goals should be:

Specific – Goals should be few and process oriented (focus on the process of an activity rather than product of a given activity) when possible. For example, a process goal would be: I will walk at a brisk pace for thirty minutes each afternoon each day for eight weeks. An example of a product goal would be: I will perform twenty push ups on June 1.

Measurable – We should review our progress to ensure that we are on the road toward achieving our goal. It may be helpful to set short term goals. Achieving a few short term goals (that increasingly challenge you) can lead you toward achieving a long term goal. It may be helpful to list when, where, and for how long an activity will be done.

Achievable – The goal must be accompanied by an action plan. In order to achieve goals we must equip ourselves with appropriate attitudes, skills and understanding. For example, someone who wishes to improve muscle fitness must: understand why she tends to procrastinate; understand concepts of muscle fitness and know how to perform progressive resistance exercises properly. Finally, we should identify obstacles we must overcome as well as the people who will support our efforts toward achieving a goal.

Rewarding – A goal should be meaningful, relevant and personally important to you.

Time constrained – long and short term goals should be time stamped. This means we should attach a deadline to our goals. It is important to remember that we can always revise our time stamps. Finally, when we achieve a goal we should recognize and celebrate our achievement. This could mean having a party or rewarding yourself in some way.

Change is a process not a single event.

The transtheoretical model (TTM) was developed by James Prochaska and Carlo DiClemente (1986). Prochaska and DiClemente proposed that at any given time a person is in one of five stages of change: precontemplation, contemplation, preparation, action or maintenance. They believe that people move from one stage to the next. Each stage is the preparation for the next one. The TTM is supported by studies of smoking cessation and alcohol and drug abuse. It can be applied to diverse health behavior change including diet, physical activity and exercise or almost any other type of behavior change. Here is an overview of each of the stages of the TTM.

Precontemplation. Here, you have no conscious intention of making a change. To move past precontemplation you must believe that an unhealthy behavior is at odds with important personal goals.

Contemplation. People who are considering a change within the next six months are classified as contemplators. People often waver for much longer than that. During contemplation we are aware that a behavior is a problem and consider doing something about it. We are not committed to taking action. We also might examine the obstacles that might have to be overcome.

Preparation. At this stage we know we must change, believe we can and are making plans to change soon. We anticipate and prepare for overcoming obstacles. We may join an exercise group or buy a healthy eating cook book. We also consider triggers that might bring back an unhealthy behavior. We equip ourselves with positive attitudes and skills to overcome our unhealthy behavior. Finally, we create a SMART short and/or long term goal with a corresponding action plan.

Action. At this time we have changed. We have stopped the unhealthy behavior. We have begun to experience the challenges of life without the old behavior. We may write down the reasons for making the change and read them every day or receive support from friends to boost our resolve.

Maintenance. When we have practiced our new behavior for at least six months we are in the maintenance stage. Here, we are working to prevent relapse and integrate the change into our life. We strive to avoid triggers associated with the old habit.

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Hanover Wellness Education News

Hanover Schools

July, 2007

STOP the ride! I want to get off!

Staying off the blood sugar/insulin roller coaster.

When we eat a doughnut, cookie, piece of candy, slice of white bread or drink a can of soda the digestible carbohydrates they contain are broken down into their sugar components (glucose). Glucose molecules are rapidly absorbed into the bloodstream and swiftly shuttled to the far reaches of the circulatory system. A quick elevation of blood sugar is followed quickly by a parallel rise of insulin. This hormone produced by cells in the pancreas, brings glucose inside of muscle and other cells. As cells quickly absorb glucose, blood sugar levels fall first, followed closely by insulin levels. Once your blood sugar hits its baseline, the liver begins releasing stored glucose to maintain a constant supply.

After a meal packed with these easily digested carbohydrates the resulting flood of insulin can drive glucose levels too low. If there isn't any more digestible carbohydrate in the stomach or intestines, your gut and brain begin sending hunger signals out even as the liver starts releasing stored glucose. The sudden drop in glucose along with other hormonal changes, causes the quick return of hunger.

Take slow, low and smooth rides

A meal containing slowly digested whole grain carbohydrates (with "good" fats and protein), levels out the glucose/insulin roller coaster ride. This is because it takes longer for the digestive system to break these carbohydrates into sugar molecules. Blood sugar and insulin levels rise more slowly and peak at lower levels. This process delays the return of hunger.

Stay off the roller coaster by avoiding processed carbohydrates such as: doughnuts, pastry, white bread, white rice, candy, and cereals made with white flour. Enjoy whole foods: legumes, whole grains, vegetables and fruits. These quality foods act like slow release medicines since they have a slow and low effect on blood sugar and insulin levels. They also keep hunger away longer.

Eat high fiber foods like whole grains and legumes

Fiber delays absorption of glucose and eases the workload of the insulin creating cells in your pancreas. Fiber helps lower cholesterol levels in the blood. It may also prevent the formation of small blood clots that trigger heart attacks and strokes (Willett, 2005).

Glycemic Load

The full effect of food on blood glucose and insulin levels depends on the amount of carbohydrate and the glycemic index of that carbohydrate (protein and fat have little effect on blood glucose). Researchers at Harvard Medical School (Willett, 2005) developed the concept of glycemic load. This is the amount of carbohydrate in a food multiplied by the glycemic index of that carbohydrate. The glycemic load is a better measurement of a food's full effect on your body's biochemistry than either the amount of carbohydrate or the glycemic index alone. Choosing foods with a low glycemic load is good for your heart and your insulin creating cells.

Several factors determine how rapidly carbohydrates in a food are broken down and the resulting glucose is absorbed into the bloodstream.

- **How swollen the starch grains are.** Starch grains swollen with water or heat, such as those in a boiled or baked potato are more easily digested than the relatively unswollen starch grains found in brown rice.
- **How much the food has been processed.** Grinding wheat into fine flour increases the rate of attacking digestive enzymes. Not only does flour have greater surface area than coarsely ground wheat grains, but it has been stripped of the protective, difficult to digest, fibrous coat that temporarily fends off enzymes from digesting the starch inside.
- **The amount of fiber in a food.** As indigestible fiber passes through the intestine, it carries along partly digested food, shielding it from immediate digestion. This spreads out the release of glucose into the blood.
- **How much fat a meal contains.** Fats tend to increase the time it takes for food to leave the stomach and enter the intestine. A food that contains fat may slow the rise in blood sugar

Diabetes and other diseases

Stratospheric blood and insulin levels are not good for your body. They can contribute to the development of diabetes and its complications such as: loss of vision, nerve damage, kidney disease, and wounds that won't heal (see the August, 2007 Hanover Wellness Education News for information on diabetes). Recent research also suggests that these high levels also contribute to heart disease, breast cancer, colon cancer and polycystic ovary syndrome (Willett, 2005).

Sugar

Would you consider swallowing seven to nine teaspoons of sugar at a time? That is the amount of sugar in a can of soda. Soda provides calories and little else. That's a problem on many levels.

An extra 100 or 150 calorie can of soda can turn into a ten or fifteen pound annual weight gain. High sugar diets cause blood sugar levels to increase rapidly and order the pancreas to pump out insulin at a furious pace. A constant and heavy demand on the pancreas to produce insulin appears to be the key to developing type 2 diabetes (especially for those who lead sedentary lifestyles). One study has found that one soda a day doubles the risk for developing diabetes (Willett, 2005).

Simple carbohydrates are sugars. The simplest of the simple are glucose, fructose (fruit sugar), and galactose (a part of milk sugar). Table sugar is called sucrose. Milk contains lactose. These simple carbohydrates provide us with energy (i.e., calories) and little else. Complex carbohydrates are long chains of linked sugars. The main complex carbohydrate is starch. Our digestive system can break down complex carbohydrates like starch into component sugars. Others are indigestible and pass largely unchanged through the stomach and intestines. These indigestible carbohydrates, called fiber, are an essential part of your diet (Willett, 2005).

The content of this newsletter is NOT meant to provide medical advice, which you should obtain from your health care provider.

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Hanover Wellness Education News

August 2007

Hanover Schools

There are 20.8 million children and adults in the United States, or 7% of the population, who have diabetes. While an estimated 14.6 million have been diagnosed, unfortunately, 6.2 million people (or nearly one-third) are unaware that they have the disease (ADA, 2007).

Diabetes is a disease in which blood glucose levels are above normal. Most of the food we eat is turned into glucose, or sugar, for our bodies to use for energy. The pancreas, an organ that lies near the stomach, makes a hormone called insulin to help glucose get into the cells of our bodies. When you have diabetes, your body either doesn't make enough insulin or can't use its own insulin as well as it should. This causes sugar to build up in your blood (CDC, 2007).

Diabetes can cause serious health complications including heart disease, blindness, kidney failure, and lower-extremity amputations. Diabetes is the sixth leading cause of death in the United States (CDC, 2007).

What are the symptoms of diabetes?

People who think they might have diabetes must visit a physician for diagnosis. They might have some or none of the following symptoms (CDC, 2007):

- Frequent urination
- Excessive thirst
- Unexplained weight loss
- Extreme hunger
- Sudden vision changes
- Tingling or numbness in hands or feet
- Feeling very tired much of the time
- Very dry skin
- Sores that are slow to heal
- More infections than usual.
- Nausea, vomiting, or stomach pains may accompany some of these symptoms in the abrupt onset of insulin-dependent diabetes, now called type 1 diabetes.

How do you get high blood glucose?

Glucose comes from the food you eat and is also made in your liver and muscles. Your blood carries the glucose to all the cells in your body. Insulin is a chemical (a hormone) made by the pancreas. The pancreas releases insulin into the blood. Insulin helps the glucose from food get into your cells. If your body doesn't make enough insulin, or if the insulin doesn't work the way it should, glucose can't get into your cells. It stays in your blood instead. Your blood glucose level then gets too high, causing pre-diabetes or diabetes (NDIC, 2007).

What is pre-diabetes?

Pre-diabetes is a condition in which blood glucose levels are higher than normal but not high enough for a diagnosis of diabetes. People with pre-diabetes are at increased risk for developing type 2 diabetes and for heart disease and stroke. The good news is, if you have pre-diabetes, you can reduce your risk of getting diabetes. With modest weight loss and moderate physical activity, you can delay or prevent type 2 diabetes and even return to normal glucose levels. Pre diabetes is characterized by high blood sugar levels on a glucose tolerance test or a fasting glucose test. Whether pre-diabetes expands into full-blown type 2 diabetes is largely up to the individual-making changes in weight, exercise, and diet can not

only prevent pre-diabetes from becoming diabetes, but can also return blood glucose levels to the normal range (HSPH, 2007).

There are three main kinds of diabetes (HSPH, 2007; NDIC, 2007): **Type 1, Type 2 and Gestational Diabetes.**

Type 1 diabetes, formerly called juvenile diabetes or insulin-dependent diabetes, is usually first diagnosed in children, teenagers, or young adults. With this form of diabetes, the beta cells of the pancreas no longer make insulin because the body's immune system has attacked and destroyed them. Treatment for type 1 diabetes includes taking insulin, making wise food choices, being physically active, taking aspirin daily (for some), and controlling blood pressure and cholesterol.

Type 2 diabetes, formerly called adult-onset diabetes or noninsulin-dependent diabetes, is the most common form of diabetes. People can develop type 2 diabetes at any age (even during childhood). This form of diabetes usually begins with insulin resistance, a condition in which fat, muscle, and liver cells do not use insulin properly. At first, the pancreas keeps up with the added demand by producing more insulin. In time, however, it loses the ability to secrete enough insulin in response to meals. When you eat, most digestible carbohydrates are converted into glucose and rapidly absorbed into the bloodstream. Any rise in blood sugar signals the pancreas to make and release insulin. This hormone instructs cells to sponge up glucose. Without it, glucose floats around the bloodstream, unable to slip inside the cells that need it.

Being overweight and inactive increases the chances of developing type 2 diabetes. Treatment includes using diabetes medicines, making wise food choices, being physically active, taking aspirin daily, and controlling blood pressure and cholesterol.

Type 2 tends to creep up on people, taking years to develop into full-blown diabetes. It begins when muscle and other cells stop responding to insulin's open-up-for-glucose signal. The body responds by making more and more insulin, essentially trying to jam blood sugar into cells. Eventually, the insulin-making cells get exhausted and begin to fail.

Some women develop **gestational diabetes** during the late stages of pregnancy. Although this form of diabetes usually goes away after the baby is born, a woman who has had it is more likely to develop type 2 diabetes later in life. Gestational diabetes is caused by the hormones of pregnancy or a shortage of insulin.

Hyperglycemia and Hypoglycemia.

Hyperglycemia is caused by having too much glucose and/or not enough insulin in the body. In fact, the symptoms of diabetes are the same as the symptoms of hyperglycemia. That's because diabetes itself causes hyperglycemia (ADA, 2007).

Hypoglycemia occurs when blood glucose goes too low. Hypoglycemia can be caused by a number of factors: too much insulin, not enough food, too much exercise, eating late, or eating too little carbohydrates. In short, it happens when insulin and blood glucose are out of balance (ADA, 2007).

Simple Steps to Preventing Diabetes (HSPH, 2007)

Diabetes is the leading cause of blindness and kidney failure among adults. It can cause mild to severe nerve damage that, coupled with diabetes-related circulation problems, can lead to the loss of a leg or foot. Diabetes significantly increases the risk of heart disease.

The good news is that type 2 diabetes is largely preventable. About 9 cases in 10 could be avoided by taking several simple steps: keeping weight under control, exercising more, eating a healthy diet, and not smoking.

- **Control your weight.** Excess weight is the single most important cause of type 2 diabetes. Being overweight makes you seven times more likely to develop type 2 diabetes. Being obese makes you 20 to 40 times more likely to develop diabetes than someone with a healthy weight. (Hu et al, 2001).
- **Get moving.** Inactivity promotes type 2 diabetes. Every two hours you spend watching TV instead of pursuing something more active increases the changes of developing diabetes by 14%.(Hu et al, 2003). Working your muscles more often and making them work harder improves their ability to use insulin and absorb glucose. This puts less stress on your insulin-making cells. Long bouts of hot, sweaty exercise aren't necessary to reap this benefit. Walking briskly for a half hour every day reduces the risk of developing type 2 diabetes by 30%.(Hu et al, 2003; Hu et al, 1999). This amount of exercise has a variety of other benefits as well. Greater cardiovascular and other benefits can be attained by more intense exercise.
- **Improve your diet.** Two dietary changes can have a big impact on the risk of type 2 diabetes. Choose whole grains and whole-grain products over highly processed carbohydrates. White bread, white rice, mashed potatoes, donuts, bagels, and many breakfast cereals cause sustained spikes in blood sugar and insulin levels. Carbohydrates that aren't as easily digested cause lower, slower increases in blood sugar and insulin. As a result, they stress the body's insulin-making machinery less, and help prevent type 2 diabetes.(Ludwig, 2002). Examples include whole wheat, brown rice, other whole grains, most beans and nuts, and whole grain breakfast cereals.
- **Choose good fats instead of bad fats.** The types of fats in your diet can also affect the development of diabetes. Good fats, such as the polyunsaturated fats found in tuna, salmon, liquid vegetable oils, and many nuts, can help ward off type 2 diabetes.(Salmeron et al, 2001). Trans fats do the opposite. These bad fats are found in margarines, packaged baked goods, fried foods in most fast-food restaurants, and any product that lists "partially hydrogenated oil" on the label. If you already have diabetes, eating fish can help protect you against a heart attack or dying from heart disease.(Hu et al, 2003b).
- **If you smoke, quit smoking.** Add type 2 diabetes to the long list of health problems linked with smoking. Smokers are 50% to 90% more likely to develop diabetes than nonsmokers (Rimm et al 1995: Rimm et al, 1993).

The key to preventing type 2 diabetes: Stay lean and stay active.

The content of this newsletter is NOT meant to provide anyone with personal medical advice, which you should obtain from your health care provider.

For more information on diabetes:

American Diabetes Association

1701 North Beauregard Street
 Alexandria VA 22311
 Telephone 703-549-1500
 1-800-ADA-ORDER to order publications toll free
 1-800-342-2383 (800-DIABETES) for diabetes information
 Internet <http://www.diabetes.org>

National Institute of Diabetes and Digestive and Kidney Diseases

1 Information Way, Bethesda, MD 20892-3560

800/GET LEVEL (800/438-5383) or 301/654-3327
Internet <http://www.niddk.nih.gov/>

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Hanover Wellness Education News

September 2007

Hanover Schools

Protecting your skin and eyes from the sun

We must protect our skin and eyes from the sun every day all year long. Our September and October issues of the wellness education news will focus on sun wellness.

The sun is the main cause of skin cancer, the most common form of cancer in the United States. There will be a million new cases of skin cancer this year. Skin cancer can and does occur in children and young adults, but most of the people who get skin cancer are older. Older people get skin cancer because they have already received too much of the sun's damaging rays. Your skin remembers each sunburn and each suntan year after year (AAP, 2007).

Most of our sun exposure, between 60 to 80%, happens before we turn 18. That's because children spend more time outdoors than most adults, especially during summer. All skin cancers are harmful and some, especially malignant melanoma, can be deadly if left untreated. Malignant melanoma is the second most common form of cancer in women 25 to 34-year-old. Sun exposure in early childhood and adolescence contributes to skin cancer.

Research has shown that two or more blistering sunburns as a child or teen increase the risk of developing skin cancer later in life. It is very important, therefore, to protect babies and children from sunburn. Do this by making sun protection a regular family event. You can be the best teacher by practicing sun protection yourself and teach all members of your family how to protect their skin. It's up to you to protect your child's skin. Sunburns can cause dehydration and fever. Too many sunburns and too much sun exposure over the years can cause skin cancer, wrinkles and possibly cataracts of the eye (AAP, 2007).

Sun safety recommendations from the American Academy of Pediatrics (AAP, 2007), American Academy of Dermatology (AAD, 2007):

Babies under 6 months of age need extra protection from the sun. Babies have sensitive skin that is thinner than adult skin. This causes them to sunburn more easily than an adult. Even babies with naturally darker skin need protection. Since young children are more vulnerable to the sun, here are some specific rules for children younger than 1 year old:

- Babies younger than 6 months should be kept out of the direct sunlight. Move your baby to the shade or under a tree, umbrella or the stroller canopy.
- Dress your baby in clothing that covers the body, such as comfortable lightweight long pants, long-sleeved shirts, and hats with brims that shade the face and cover the ears.
- If your baby gets a sunburn and is younger than 1 year of age, contact your pediatrician at once - a severe sunburn is an emergency.
- If you cannot keep your child covered and in the shade, sunscreen can be applied. However, before covering your baby with sunscreen, be sure to apply a small amount to a limited area and watch for any reaction.

For children older than 1 and all family members, follow these simple rules to protect your family from sunburns now and from skin cancer later in life:

- Choose sunscreen made for children, preferably waterproof. Before covering your child completely, test the sunscreen on your child's back for a reaction. Apply carefully around the eyes, avoiding the eyelids. If a rash develops, talk to your pediatrician.
- Select clothes made of tightly woven fabrics. Clothes that have a tighter weave - the way a fabric is constructed - generally protect better than clothes with a broader weave. If you're not sure

about how tight a fabric's weave is, hold the clothing up to a lamp or window and see how much light shines through. The less light, the better. Clothing made of cotton is both cool and protective.

- If your child gets a sunburn that results in blistering, pain or fever, contact your pediatrician.
- When using a cap with a bill, make sure the bill is facing forward to shield your child's face. Sunglasses with UV protection also are a good idea for protecting your child's eyes.

Here are some additional sun safety tips that apply to all members of your family:

- The sun's rays are the strongest between 10 a.m. and 4 p.m. (daylight savings time 9:00 A.M. to 3:00 P.M.). Try to keep out of the sun during these hours.
- The sun's damaging UV rays can bounce back from sand, snow or concrete; so be particularly careful in these areas.
- Most of the sun's rays can come through the clouds on an overcast day; so use sun protection even on cloudy days.
- When choosing a sunscreen, look for the words "broad-spectrum" on the label - it means that the sunscreen will screen out both ultraviolet B (UVB) and ultraviolet A (UVA) rays.
- Choose a water-resistant or waterproof sunscreen. Sunscreens that are "waterproof" should be reapplied every two hours, especially if your child is playing in the water.
- Zinc oxide, a very effective sunblock, can be used as extra protection on the nose, cheeks, tops of the ears and on the shoulders.
- Use a sun protection factor (SPF) of at least 15. When using a SPF 15 sunscreen, a fair-skinned person who normally sunburns in 20 minutes of midday sun exposure may tolerate 15 times 20 minutes (300 minutes) without burning.
- Turning pink? Unprotected skin can be damaged by the sun's UV rays in as little as 15 minutes. Yet it can take up to 12 hours for skin to show the full effect of sun exposure. So, if your child's skin looks "a little pink" today, it may be burned tomorrow morning. To prevent further burning, get your child out of the sun.
- Rub sunscreen in well, making sure to cover all exposed areas, especially your child's face, nose, ears, feet and hands, and even the backs of the knees.
- Put on sunscreen 30 minutes before going outdoors - it needs time to work on the skin.
- Keep your child completely out of the sun until a sunburn is totally healed.
- Sunscreens should be used for sun protection and not as a reason to stay in the sun longer.

What is the UV index?

The UV Index can help the public be aware of the level of UV radiation exposure expected on a given day. As a result, people can use simple sun protective behaviors to reduce their lifetime risk of developing skin cancer and other sun-related illnesses. Here is a UV index overview:

Exposure Category	Index Number	Sun Protection Messages
LOW	<2	Wear sunglasses on bright days. In winter, reflection off snow can nearly double UV strength. If you burn easily, cover up and use sunscreen.
MODERATE	3-5	Take precautions, such as covering up and using sunscreen, if you will be outside. Stay in shade near midday when the sun is strongest.
HIGH	6-7	Protection against sunburn is needed. Reduce time in the sun between 11 a.m.

		and 4 p.m. Cover up, wear a hat and sunglasses, and use sunscreen.
VERY HIGH	8-10	Take extra precautions. Unprotected skin will be damaged and can burn quickly. Try to avoid the sun between 11 a.m. and 4 p.m. Otherwise, seek shade, cover up, wear a hat and sunglasses, and use sunscreen.
EXTREME	11+	Take all precautions. Unprotected skin can burn in minutes. Beachgoers should know that white sand and other bright surfaces reflect UV and will increase UV exposure. Avoid the sun between 11 a.m. and 4 p.m. Seek shade, cover up, wear a hat and sunglasses, and use sunscreen.

Source: U.S. Environmental Protection Agency - <http://www.epa.gov/sunwise/stayheal.html>

Protecting your eyes from the sun (AAO, 2006)

Long-term exposure to invisible ultraviolet radiation can damage our eyes and lead to vision loss. Everyone is at risk, even children.

Like your skin, your eyes never recover from UV exposure. Studies show that exposure to bright sunlight may increase the risk of developing cataracts and age-related macular degeneration, both leading causes of vision loss among older adults. UV exposure, wind and dust can also cause pterygia, benign growths on the eye's surface. The more exposure to bright light, the greater the chance of developing these eye conditions.

In addition to the damage caused by a lifetime of exposure to bright sun, you need to protect your eyes from acute damage caused by outings on very bright days. Excessive exposure to ultraviolet light reflected off sand, snow, water or pavement can damage the cornea, the eye's surface. "Sun damage to eyes can occur anytime during the year, not just in the summertime," said Richard Bensinger, MD, a comprehensive ophthalmologist in Seattle, Wash. "You should protect your eyes from damage all year long."

Similar to a sunburn on your skin, corneal ultraviolet injuries are painful, but usually heal quickly. Take these steps to protect your eyes from the sun:

- Select sunglasses that block ultraviolet rays. Don't be deceived by color or cost. The ability to block UV light is not dependent on the darkness of the lens or the price tag.
- Make sure your sunglasses block 99 percent or 100 percent of UV-A and UV-B rays.
- Ideally, your sunglasses should wrap all the way around to your temples, so the sun's rays can't enter from the side.
- In addition to your sunglasses, wear a broad-rimmed hat to protect your eyes. Don't be fooled by a cloudy day. The sun's rays can pass through the haze and thin clouds.
- Even if you wear contacts with UV protection, remember your sunglasses.
- Sunglasses should be worn whenever you are outside, and it's especially important to wear sunglasses in the early afternoon and in higher altitudes, where UV light is more intense.

The content of this newsletter is NOT meant to provide anyone with personal medical advice, which you should obtain from your health care provider.

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Hanover Wellness Education News

October 2007

Hanover Schools

Sun safety and Vitamin D

This month's news "shines a light" on where to get your vitamin D: from diet and/or the sun. We will explore the controversy surrounding how to obtain adequate vitamin D.

Vitamin D isn't exactly a vitamin. It is a hormone made by your skin. Sunlight hitting the skin turns a cousin of cholesterol into pre vitamin D. Very few foods naturally contain vitamin D (Willett, 2005). Coldwater fish such as mackerel, salmon, sardines, and bluefish contain plenty of this fat soluble vitamin (dairy products and some breakfast cereals can also be good sources). Vitamin D ensures that calcium and phosphorus are absorbed as they pass through the digestive system. Vitamin D inhibits the breakdown of bone and increases bone building activity in the body. Laboratory studies also show that vitamin D keeps cancer cells from growing and dividing. Some preliminary studies indicate that insufficient intake of vitamin D is associated with an increased risk of fractures. Vitamin D supplementation may prevent them (Papadimitripoulos et al, 2002). Dr. Walter Willett of Harvard Medical School (2005) recommends adults get 800 to 1,000 IU of vitamin D each day.

If you live north of the line connecting San Francisco to Philadelphia, you may not be getting enough vitamin D. This is also true for those who do not or cannot go outside for at least a 15-minute daily walk in the sun. African-Americans and others with dark skin tend to have much lower levels of vitamin D, due to less formation of the vitamin from the action of sunlight on skin (Willett, 2005).

Don't Seek the Sun: Top Reasons to Get Vitamin D From Diet – from the American Academy of Dermatology (2007)

Our bodies need vitamin D to build and maintain strong bones. Without vitamin D, the body cannot use calcium and phosphorus — two minerals necessary for healthy bones. The American Academy of Dermatology (Academy) does not recommend getting vitamin D from sun exposure or indoor tanning. Both sources emit ultraviolet (UV) radiation. Getting vitamin D from your diet and practicing sun protection offer a healthier alternative. Consider these facts:

UV rays cause premature aging of the skin, actinic keratoses and skin cancer. There is so much scientific evidence to support this fact that the U.S. Department of Health and Human Services classifies UV radiation as a known carcinogen (cancer-causing agent). UV exposure also causes cataracts and suppresses the body's immune system

More than 1 million cases of skin cancer will be diagnosed this year. While the benefits of vitamin D in helping to reduce the risk of many cancers have yet to be fully proven, it is well known that overexposure to UV radiation causes skin cancer.

Dietary sources of vitamin D do not prematurely age the skin nor increase the risk of developing skin cancer or actinic keratoses. Dietary sources are available year round.

Sunscreen use does not cause vitamin D deficiency. A study conducted in Australia, which has the highest incidence of skin cancer in the world, found that sunscreen did not cause vitamin D deficiency in all 113 people who wore adequate sunscreen to prevent actinic keratoses. Research shows that sunscreen helps prevent premature aging, actinic keratoses and skin cancer.

When used correctly, sunscreen with a Sun Protection Factor (SPF) of 15 deflects or absorbs 93% of the sun's UVB rays and allows 7% to penetrate skin. In addition, the average person requires one ounce of sunscreen, enough to fill a shot glass, to adequately cover the exposed areas of the body. Most people

don't use enough sunscreen to receive the level of protection that is indicated on the package. Many people also fail to apply sunscreen at least 15-30 minutes before going outdoors in order to allow it to be completely absorbed into the skin, and they neglect to re-apply it every two hours or after swimming.

We need calcium to benefit from vitamin D. Sun exposure does not provide calcium. However, fortified milk, other vitamin D-fortified dairy products, and salmon are rich in both vitamin D and calcium. Many dietary supplements also contain both. Getting enough calcium and vitamin D is essential to prevent osteoporosis.

Vitamin D from food and dietary supplements offers the same benefits — without the danger of UV exposure — as vitamin D obtained from the sun. Vitamin D cannot be used by the body until it is processed by the liver and the kidneys. The usable form of vitamin D created by this process is the same — regardless of how it enters the body.

The exact amount of time in the sun depends on many factors including location, time of day, time of year, and skin type. For a fair-skinned person in Boston at noon in June, it is 2-5 minutes. After this, any extra vitamin D that the body produces will not be stored for future use. Additional unprotected exposure will result in an increased risk of premature aging and skin cancer.

Getting vitamin D from the sun (NIH, 2007).

Sun exposure is possibly the most important source of vitamin D because exposure to sunlight provides most humans with their vitamin D requirement. UV rays from the sun trigger vitamin D synthesis in skin. Season, geographic latitude, time of day, cloud cover, smog, and sunscreen all affect UV ray exposure and vitamin D synthesis. Sunlight exposure from November through February in Boston is insufficient to produce significant vitamin D synthesis in the skin. Complete cloud cover halves the energy of UV rays, and shade reduces it by 60%. Industrial pollution, which increases shade, also decreases sun exposure and may contribute to the development of rickets in individuals with insufficient dietary intake of vitamin D. Sunscreens with a sun protection factor (SPF) of 8 or greater will block UV rays that produce vitamin D, but it is still important to routinely use sunscreen to help prevent skin cancer and other negative consequences of excessive sun exposure. An initial exposure to sunlight (10 -15 minutes) allows adequate time for Vitamin D synthesis and should be followed by application of a sunscreen with an SPF of at least 15 to protect the skin. Ten to fifteen minutes of sun exposure at least two times per week to the face, arms, hands, or back without sunscreen is usually sufficient to provide adequate vitamin D. It is very important for individuals with limited sun exposure to include good sources of vitamin D in their diet.

Dr. Michael Holick is a professor at Boston University School of Medicine. Dr. Holick has studied vitamin D extensively for more than 20 years. His concern with complete sun protection is that it could lead to a deficiency in the body's production of vitamin D. This deficiency has a range of documented consequences in terms of bone health. Dr. Holick suggests the need for a more balanced approach to sun exposure (HSPH, 2003).

In the United States, very few people get 1000 IU of vitamin D through diet alone. A more practical way to achieve optimal vitamin D levels, according to Dr. Holick, is to expose the skin to small doses of sunlight on a regular basis. Sun exposure triggers the skin to produce vitamin D, which is then metabolized and converted in the body to its active and useful form.

The amount of vitamin D produced by the skin after sun exposure varies considerably with the amount of ultraviolet radiation that is permitted to penetrate the skin. Dr. Holick and colleagues found that using sunscreen with a sun protection factor of 8 reduced the skin's production of vitamin D by 98 percent. Skin pigment has similar effects, with African Americans having much lower levels of vitamin D production than caucasians. Other contributing factors include season and latitude. In northern areas, vitamin D production is much lower in winter than summer because the sun's rays are indirect and more easily absorbed by the ozone layer. In areas like Florida, however, vitamin D production remains stable because the sun's rays are direct year-round.

Several lines of evidence have led researchers like Dr. Holick to speculate that sun exposure and subsequent vitamin D production might somehow influence the development of cancer. A number of studies have suggested that cancer incidence and mortality are higher in northern areas than southern areas. Second, active vitamin D has been shown to be a potent inhibitor of cell growth and can be produced by a number of different types of cells, including those in the colon, breast, prostate, and skin. Dr. Holick believes that the current public health recommendations around sun exposure need to be modified. Instead of recommending full skin protection at all times, he suggests that people allow their face, arms, and hands to be exposed for 5 to 15 minutes two or three times a week. For more extensive periods of sun exposure, people should use sunscreen, shade, and clothing to protect their skin. According to Dr. Holick, this approach will lead to healthy vitamin D levels without raising the risk of skin cancer.

Dr. Holick's recommendations have angered many in the dermatology community (Allen, 2004). His recommendations are in direct contrast to the American Academy of Dermatology's (see September wellness news for their sun safety recommendations) sun safety recommendations.

The content of this newsletter is NOT meant to provide anyone with personal medical advice, which you should obtain from your health care provider.

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What is high blood cholesterol?

Too much cholesterol in the blood, or high blood cholesterol, can be serious. People with high blood cholesterol have a greater chance of getting heart disease. Many people are unaware that their cholesterol is high. High blood cholesterol is also known as hypercholesterolemia and hyperlipidemia (USNLM, 2007; NHLBI, 2007).

What is cholesterol?

To understand high blood cholesterol, it is important to know more about cholesterol. Cholesterol is a waxy, fat like substance that is found in all cells of the body. Your body needs some cholesterol to work the right way and makes all the cholesterol you need. It is also found in some of the foods you eat. You use cholesterol to make hormones, Vitamin D and substances that help digest foods (NHLBI, 2007).

But if you have too much in your blood, it can stick to the walls of your arteries. This is called plaque. Plaque can narrow your arteries or even block them. High levels of cholesterol in the blood can increase your risk of heart disease. Your cholesterol levels tend to rise as you get older. There are usually no signs or symptoms that you have high blood cholesterol. It can be detected with a blood test. High cholesterol is more likely if: family members have it; one is overweight; or if we consume a lot of trans fats and saturated fats. Cholesterol levels can be decreased by participating in regular physical activity and following USDA recommendations for fruit and vegetable consumption (NHLBI, 2007).

Blood is watery and cholesterol is fatty. Just like oil and water the two do not mix. In order to travel in the bloodstream, cholesterol is carried in small packages called lipoproteins. The small packages are made of fat (lipid) on the inside and proteins on the outside. Two kinds of lipoproteins carry cholesterol throughout your body. It is important to have healthy levels of both:

LDL (low density lipoproteins) cholesterol is sometimes referred to as the “bad” cholesterol. High LDL cholesterol can lead to a buildup of cholesterol in arteries.

HDL (high density lipoproteins) cholesterol is sometimes called the “good” cholesterol. HDL protects against heart disease (NHLBI, 2007). Medical experts think that HDL tends to carry cholesterol away from the arteries and back to the liver, where it's passed from the body. Some experts believe that that HDL removes excess cholesterol from arterial plaque, thus slowing its buildup (AHA, 2007).

Why Is Cholesterol Important?

Your blood cholesterol level has a lot to do with your chances of getting heart disease. High blood cholesterol is one of the major risk factors for heart disease. A risk factor is a condition that increases your chance of getting a disease. In fact, the higher your blood cholesterol level, the greater your risk for developing heart disease or having a heart attack (NHLBI, 2007).

How Does Cholesterol Cause Heart Disease?

When there is too much cholesterol (a fat-like substance) in your blood, it builds up in the walls of your arteries. Over time, this buildup causes "hardening of the arteries" so that arteries become narrowed and blood flow to the heart is slowed down or blocked. The blood carries oxygen to the heart, and if enough blood and oxygen cannot reach your heart, you may suffer chest pain. If the blood supply to a portion of the heart is completely cut off by a blockage, the result is a heart attack.

Many people are unaware that their cholesterol level is too high. It is important to find out what your cholesterol numbers are because lowering cholesterol levels that are too high lessens the risk for developing heart disease and reduces the chance of a heart attack or dying of heart disease, even if you already have it. Cholesterol lowering is important for everyone--younger, middle age, and older adults; women and men; and people with or without heart disease (NHLBI, 2006; NHLBI, 2007).

What Do Your Cholesterol Numbers Mean?

A "lipoprotein profile" indicates one's cholesterol levels. This blood test is done after a 9- to 12-hour fast and gives information about:

- Total cholesterol
- LDL (bad) cholesterol--the main source of cholesterol buildup and blockage in the arteries
- HDL (good) cholesterol--helps keep cholesterol from building up in the arteries
- Triglycerides--another form of fat in your blood

Cholesterol levels are measured in milligrams (mg) of cholesterol per deciliter (dL) of blood (see the table below).

Total cholesterol level	Total cholesterol category
Less than 200 mg/dL	Desirable
200-239 mg/dL	Borderline high
240 mg/dL and above	High

LDL cholesterol level	LDL cholesterol category
Less than 100 mg/dL	Optimal
100-129 mg/dL	Near optimal/above optimal
130-159 mg/dL	Borderline high
160-189 mg/dL	High
190 mg/dL and above	Very high

HDL cholesterol level	HDL cholesterol category
Less than 40 mg/dL	A major risk factor for heart disease
60 mg/dL and above	Considered protective against heart disease

Triglyceride level	Triglyceride category
150-199 mg/dL	Borderline high
200 and above mg/dL	High

(NHLBI, 2007)

The content of this newsletter is NOT intended to provide anyone with personal medical advice which you should obtain from your health care provider.

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What causes high blood cholesterol?

A variety of things can affect the cholesterol levels in your blood (NHLBI, 2007). Some of these things you can control and others you cannot.

These are things you can do something about:

- **Diet.** Saturated fat and cholesterol in the food you eat make your blood cholesterol level go up. Saturated fat is the main culprit, but cholesterol in foods also matters. Reducing the amount of saturated fat and cholesterol in your diet helps lower your blood cholesterol level.
- **Weight.** Being overweight is a risk factor for heart disease. It also tends to increase your cholesterol. Losing weight can help lower your LDL and total cholesterol levels, as well as raise your HDL and lower your triglyceride levels.
- **Physical Activity.** Not being physically active is a risk factor for heart disease. Regular physical activity can help lower LDL (bad) cholesterol and raise HDL (good) cholesterol levels. It also helps you lose weight. You should try to be physically active for 30 minutes on most, if not all, days.

Things you cannot do anything about also can affect cholesterol levels. These include:

- **Age and Gender.** As women and men get older, their cholesterol levels rise. Before the age of menopause, women have lower total cholesterol levels than men of the same age. After the age of menopause, women's LDL levels tend to rise.
- **Heredity.** Your genes partly determine how much cholesterol your body makes. High blood cholesterol can run in families.

What is coronary artery disease?

Coronary artery disease (CAD) is the most common type of heart disease (NHLBI, 2007). CAD happens when the arteries that supply blood to heart muscle become hardened and narrowed. This is due to the buildup of cholesterol and other material, called plaque, on their inner walls. As the buildup grows, less blood can flow through the arteries. As a result, the heart muscle can't get the blood or oxygen it needs. This can lead to chest pain (angina) or a heart attack. Most heart attacks happen when a blood clot suddenly cuts off the hearts' blood supply, causing heart damage (NHLBI, 2006).

Over time, CAD can weaken the heart muscle and contribute to heart failure and arrhythmias. Heart failure means the heart can't pump blood well to the rest of the body. Arrhythmias are changes in the normal beating rhythm of the heart.

Other Names for Coronary Artery Disease

- CAD
- Coronary heart disease (CHD)
- Heart disease
- Ischemic (is-KE-mik) heart disease

What Causes Coronary Artery Disease?

Coronary artery disease (CAD) is caused by atherosclerosis (the thickening and hardening of the inside walls of arteries). Some hardening of the arteries occurs normally as a person grows older (NHLBI, 2007).

In atherosclerosis, plaque deposits build up in the arteries. Plaque is made up of fat, cholesterol, calcium, and other substances from the blood. Plaque buildup in the arteries often begins in childhood. Over time, plaque buildup in the coronary arteries can:

- Narrow the arteries. This reduces the amount of blood and oxygen that reaches the heart muscle.
- Completely block the arteries. This stops the flow of blood to the heart muscle.
- Cause blood clots to form. This can block the arteries that supply blood to the heart muscle.

Plaque in the arteries can be:

- Hard and stable. Hard plaque causes the artery walls to thicken and harden. This condition is associated more with angina than with a heart attack, but heart attacks frequently occur with hard plaque.
- Soft and unstable. Soft plaque is more likely to break open or to break off from the artery walls and cause blood clots. This can lead to a heart attack.

What Are the Signs and Symptoms of Coronary Artery Disease?

The most common symptoms of coronary artery disease (CAD) are (NHLBI, 2007):

- Chest pain or chest discomfort (angina) or pain in one or both arms or in the left shoulder, neck, jaw, or back
- Shortness of breath

The severity of symptoms varies widely. Symptoms may become more severe as coronary arteries become narrower due to the buildup of plaque (atherosclerosis).

In some people, the first sign of CAD is a heart attack. A heart attack happens when plaque in a coronary artery breaks apart, causing a blood clot to form and block the artery.

The content of this newsletter is NOT intended to provide anyone with personal medical advice which you should obtain from your health care provider.

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