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Interdisciplinary Perspectives in Lifetime Wellness

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Interdisciplinary Perspectives in Lifetime Wellness

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An Open Educational Resource for Learners in the 2020s

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Interdisciplinary Perspectives in Lifetime Wellness

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Class 1-1: Navigating Wellness

Overview

Overview

Class 1-1: Navigating Wellness will:

Show you what to expect from this course.

Introduce the foundational concepts we'll build on with each new class.

Prepare you to succeed with our course.

Objectives

After completing Class 1-1, you will be able to:

1. Identify the purpose and intended outcomes of this course.
2. Differentiate between the concepts of "health," "fitness," and "wellness."
3. Discuss the theory of needs using one of your favorite characters from TV, books, movies, etc.
4. Reflect on your learning and prepare to succeed in the course.

Outline of Today's Class

- Read through today's materials:
    1. Overview
    2. Getting Started with Lifetime Wellness
    3. What is Wellness?
    4. Thinking About Wellness
    5. Summary

Next> Getting Started with Lifetime Wellness

Now that you've looked over the agenda for today, read "Getting Started with Lifetime Wellness" to learn about the course.

Class 1-1: Navigating Wellness

Getting Started with Lifetime Wellness

Welcome

Welcome to KINS 1106 - Lifetime Wellness!

This course is designed to be accessible, easy-to-navigate, and easy to work into your schedule.

By working through each Class, you will grow your ability to develop informed, nuanced understandings about a variety of topics related to your personal, lifelong well-being.

The following pages will introduce you to the purpose, expectations, and routines of the course.

Why This Course?

Think of all that you have accomplished to reach this point in your life, and all the challenges you faced in that journey.

In your path, you may encounter - or have already encountered - many obstacles to living the life you would like.

You may face insecurity in meeting your basic needs for food, water, shelter, and safety.

You may find difficulty in knowing yourself, in connecting with others, in addressing the innate human need to be validated, cared for, and supported.

You may be grappling with the impacts of a difficult childhood, sociohistorical pressures, intergenerational trauma, or other challenging experiences.

You may be learning to live with illness, facing the illness of family and friends, or even experiencing grief and loss.

You may feel the pressure of overwhelming social and environmental problems, or struggle to grow and maintain healthy relationships with others.

You may be looking forward at the next stage of your life with concerns, doubts, and worries.

Throughout your life, you may face these or other challenges to your ability to live well.

Though many of the obstacles above do not have simple answers, bringing together scientific findings from a variety of fields can equip us to navigate through them as best we can - recognizing what choices we have available and practicing making the ones that support our goals and intentions.

When we look at our personal wellness, we are looking at how we move through this large interconnected world in which we live.

This course is intended to help you:

develop a better awareness of your own experience

connect with your fellow students and share those experiences

learn well-demonstrated theories and acquire evidence-based tools that you may find helpful in managing your personal obstacles as you progress on your journey throughout life.

Next> What is Wellness?

Now that you know the purpose of this course, review the next page titled "What to Expect."

Class 1-1: Navigating Wellness

What is Wellness?

What is Wellness?

The word "Wellness" can be hard to define.

What does it mean to you?

It might bring to mind closely related concepts, like health (the general absence of illness or injury) and fitness (your ability to meet the demands of your tasks and goals), phrases like "self-care" and "treat yourself," or perhaps any number of products and services that use the term for marketing.

Conversely, you might think of some of the obstacles to living your ideal life, like pressure from friends, family, and society and limitations of time, money, and energy.

Thinking about the challenges and difficulties you have faced in the past, that you face now, and that you might face in the future:

- What experiences, tools, and information prepared you for those challenges and difficulties in the past?
- How are you managing your challenges and difficulties here, now, in the present?
- How do you deal with the uncertainty of the challenges and difficulties that the future may bring?

By exploring these questions in your own life, you can develop routines, habits, and strategies that help you succeed in your goals and live your best life. This is the abstract concept we call being *well*.

In our next class, you'll explore the idea of wellness further through seven areas of life, so it is fine to have just a general idea of this term right now.

Today, we'll begin thinking about wellness by looking at needs.

What are your needs?

Though the experiences you thought of a moment ago are unique to you, we as humans share some common needs.

These include things necessary for survival like food, water, shelter, and air, as well as other needs related to our emotional, social, and psychological health and development.

The psychologist Abraham Maslow theorized that much of common human behavior is based on these needs.

His most influential idea is often represented as a pyramid, with survival needs - like food, water, air, and rest - at the bottom.

As the foundation for someone's life, these survival needs become priorities and driving forces for behavior when not met.

When those needs *are* met (at least for the immediate future), a person can direct their energy and efforts towards needs related to emotional, social, and psychological health, such as the belonging to a group, being cared for, and finding recognition and purpose.

You might think of times you heard "I'm sorry I said that, I was just hungry," or how the determination to study for an exam late into the night is eventually overtaken by the need to sleep.

When we look at wellness in the context of these needs, we can think of wellness behaviors as ones that enable us to care for ourselves and our communities, to take steps - like being physically active and eating nutritious foods - that help avoid preventable illness and support longevity and mobility, and to manage existing conditions and obstacles to the greatest extent that is possible.

Other behaviors that can support wellness might include:

- setting healthy boundaries with those around you
- understanding and being aware of your emotional and psychological experience
- having areas of satisfaction and fulfillment in life
- making choices consistent with your beliefs and goals
- continuing to grow and adapt throughout each stage of the lifespan
- having a sense of meaning and purpose

When we use the word "wellness," we're considering both our personal behaviors and our greater environment to look at how we can best move through life.

Exploring these ideas can be freeing, inspiring, concerning, even - understandably - uncomfortable; however, doing so can offer a clearer awareness of your life, helping you navigate through the world, develop strategies and find resources, practice self-advocacy in relationships and other situations, and succeed in setting and achieving your personal and professional goals.

Next>Thinking About Wellness

Continue to learn about the concept of metacognition and how it can help you navigate the world around you.

Stage 1-1: Navigating Wellness

Thinking about Wellness

What is Metacognition?

This course will focus on concepts, resources, context, and skills that may be useful as you move throughout your life.

The first of these is *metacognition*.

Metacognition can help you be more effective in your education, your relationships, and your career.

What does this word mean and how can we use it?

> *Cognition* is our thinking, our ability to turn over ideas and explore them.
>
> > We might think of "cognitive psychology," the English word "cognizant" (meaning to be aware) or even the Spanish verb *conocer,* meaning "to know."
>
> *Meta* means "self-referential" or "a level above".
>
> > The prefix might bring to mind characters in media who are aware that they're fictional, like the Marvel character Deadpool or Abed Nadir of the TV show Community.

Meta-cognition then means to be outside or above our own thinking.

That is, to be aware of our thoughts and internal processes in order to inform our behaviors and choices.

> *Optional: Visit this website to learn more about metacognition, including a short video discussing the concept.*

Metacognitive Strategies

Developing the skill of metacognition allows us to monitor, evaluate, and adjust how we approach learning, work, and interaction.

For example:

> If I know that I have only a few hours to study five chapters for an exam, I might feel overwhelmed by all the things I have to review.

I might sit down to start reviewing with the first chapter, become overwhelmed, and decide to not bother studying - leading to a less-than-ideal outcome (a failing grade).

Instead, I can use metacognition to think critically about my learning and come up with a more helpful strategy.

I know that I need to cut down on what to study, so I may ask myself "What do I *already* know?"

Listing out what I can recall about each topic, I might realize that I remember most of Chapters 1 and 2 from a class last year, Chapter 5 covers the same stuff I'm learning in another class, and I kinda-sorta know Chapter 4... but also that I missed Chapter 3 entirely!

Now I know how to strategize, focusing my time first on Chapter 3. That way, I can at least earn some of those points.

Once I've done that, if I have time, I can look over Chapters 4 and 5.

And I know I don't need to pressure myself about Chapter 1 and Chapter 2.

In this situation, taking a few minutes to think metacognitively can remove unnecessary stress, improve the likelihood of a passing grade, and save time and energy that I can use elsewhere!

Developing the skill of metacognition, or thinking about thinking, can help you make better informed and more active decisions in many situations.

In today's activity, you'll perform a self-inventory that asks you to reflect on your behaviors and perceptions as they relate to learning and well-being in order to practice metacognition and observe your thoughts about learning.

Next>Summary

Continue to the next page for a summary of what you've learned today and to see the activities you will use to further your learning and complete today's class.

Stage 1-1: Navigating Wellness

Summary

Major Points

During this first class, you have learned:

- Health - The absence of illness or injury.
- Fitness - Your ability to meet the demands of your tasks and goals.
- Wellness - The abstract concept of living in a way allows you to meet your needs, work toward your goals, and move through life in the best way possible.

- Abraham Maslow's general theory that human behavior is based around needs.
    - When survival needs (food, water, air, shelter, safety) are not met, these are a person's priority. Their behavior is focused on obtaining these necessities.
    - When survival needs are less of a concern, behavior can be directed towards building relationships and connecting with others (psychological, social, and emotional needs).
    - When survival needs are met as well as the emotional, social, and psychological needs, a person can focus on developing themselves further.
- Metacognition is a skill and faculty that can be learned and developed by practice.
    - Metacognitive strategies can help you take control over your education, assist with navigating relationships and help, you understand and fulfill your needs.

Class 1-2: Exploring Wellness

Overview

Today's Class Overview

In today's class, you will explore the concept of wellness further by looking at seven areas life, as well as learning more about how we think, how we feel, and how these impact our ability to be well.

Today's Class Objectives

By the end of this module you should be able to:

1. Describe behaviors that contribute to wellness through various dimensions or areas.
2. Identify the major causes of death in the United States.
3. Evaluate your own wellness behaviors.
4. Recognize cognitive distortions and other irrational thought processes.
5. Describe emotional intelligence and how it benefits performance and wellness.
6. Apply the R.U.L.E.R. method to understand and manage emotions for well-being.

Outline of Today's Class

- Materials
    1. Overview
    2. Review
    3. Seven Dimensions of Wellness
    4. Wellness and Mortality
    5. Mortality: Reporting vs Reality
    6. Thinking Clearly
    7. Making Sense of Cognitive Bias
    8. Emotions and Cognition
    9. Building Emotional Intelligence
    10. How Many Emotions Do Humans Have?
    11. Summary

Next>Review Last Class

Class 1-2: Exploring Wellness

Review

Reviewing Last Class

Last class, you learned what to expect, the purpose of this course, and how to prepare for success. Review the highlights below to ensure you are ready to proceed.

- Course Policies
    - Learning is an on-going process; always strive to develop a more thorough and nuanced understanding.
    - Be sure to practice professionalism and appropriate etiquette throughout the course in preparation for your career.
    - Always keep in mind that "the expression of academic freedom requires civility."
    - Respect the innate humanity of all persons and the validity of their experience.
    - Operate in good faith throughout your participation in the course.

As well, you began learning about the concepts of wellness, needs, and metacognition.

- Wellness
    - The abstract idea of living one's best life.
        - Differentiate from:
            - health (absence of illness or injury)
            - fitness (the ability to meet the demands of a task, like keeping your heart healthy)
- Maslow's Hierarchy of Needs
    - Abraham Maslow's general theory that human behavior is based around needs.
        - When survival needs (food, water, air, shelter, safety) are not met, these are a person's priority. Their behavior is focused on obtaining these necessities.
        - When survival needs are less of a concern, behavior can be directed towards building relationships and connecting with others (psychological, social, and emotional needs).

        - When survival needs are met as well as the emotional, social, and psychological needs, a person can focus on developing themselves further.
- Metacognition is a skill and faculty that can be learned and developed by practice.
    - Metacognitive strategies can help you take control over your education, assist with navigating relationships and help, you understand and fulfill your needs.

Next>Seven Dimensions of Wellness

Begin today's learning by exploring the idea of "wellness" further through seven areas of life and seeing some examples of behaviors that support well-being in each dimension.

Class 1-2: Exploring Wellness

Dimensions of Wellness

We can begin to understand the broad, abstract concept of wellness better by considering different areas (or dimensions) of our lives.

Visit this downloadable Wellness Dimensions Guide offered by Simon Fraser University to learn about the Dimensions of Wellness.

Next>Wellness and Mortality

Class 1-2: Exploring Wellness

Wellness and Mortality

Applying the Dimensions of Wellness

On the previous page, you learned to consider the idea of "wellness" through seven categories, or dimensions.

As well, you read about some behaviors that can help develop or maintain well-being in each dimension.

Like Maslow's Hierarchy of Needs, the idea of "Wellness Dimensions" is a tool that can help us think about our lives and make choices and decisions.

In today's activity, you will be asked a series of questions about these seven dimensions to help you think about your own wellness.

Morbidity and Mortality

While it can be unpleasant to think about, we know that our lifespan is limited and that we are likely to encounter at least a few illnesses, injuries, and diseases during our lifetime.

Though it isn't always pleasant to consider, we can learn a lot about the challenges to health looking by looking at the most common causes of death, called mortality.

Similarly, living well can be made more difficult by illnesses and diseases, referred to as morbidity.

Morbidities include diseases like diabetes, cancer. When multiple diseases are present, they are called co-morbidities.

Many morbidities do not cause death for many years, though they can negatively affect quality of life in many ways.

Exploring these can tell us a lot about what it means to be "well."

Visit the following link to explore an interactive visualization of causes of death statistics from the Centers for Disease Control and Prevention.

Next>Reporting vs. Reality

Every day we hear about frightening things on the news. How does what we hear about most match up with how most people actually die?

Class 1-2: Exploring Wellness

Reporting vs Reality

Looking Further

Were you surprised to learn which causes of death are most common?

A group of students at the University of California San Diego were inspired by earlier researchers to compare the reality of the common causes of death with the reporting of death in major media outlets.

What do you think they found?

The following has been excerpted and adapted from Owen Shen's website Charting Death: Reality vs Reported under fair use:

Charting Death: Reporting vs Reality

Site and writeup by Owen Shen. Data collection and analysis by Owen Shen, Hasan Al-Jamaly, Maximillian Siemers, and Nicole Stone.

Background

How do people die?

How do people think we die?

And is there a difference?

Well, it turns out there's a fascinating study conducted by Paul Slovic and Barbara Combs where they looked at how often different types of deaths were mentioned in the news. They then compared the frequency of news coverage with the actual frequency of people who died for each cause.

The results are what one might cynically expect:

"Although all diseases claim almost 1,OOO times as many lives as do homicides, there were about three times as many articles about homicides than about all diseases. Furthermore, homicide articles tended to be more

than twice as long as articles reporting deaths from diseases and accidents."

Since 1979, when the original Combs and Slovic study was conducted, there have been several more empirical analyses which have found largely similar results. (Notably, here and here)

For our final capstone project for the fantastic Bradley Voytek's COGS 108 course at UCSD, we thought it would be interesting for us to have our own go at examining potential disparities between actual deaths and their corresponding media attention.

For anyone curious about any of the steps throughout this project, the original data and code we used to do all this analysis is available here on GitHub.

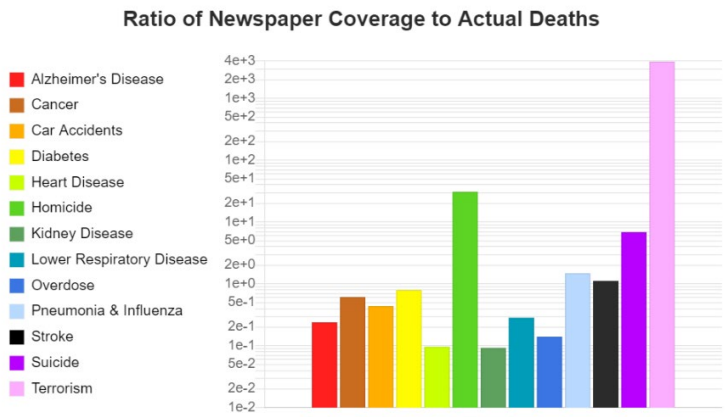
Data: The Gathering

For our project, we looked at four sources: The Center for Disease Control's WONDER database for public health data (1999-2016). Google Trends search volume (2004-2016). The Guardian's article database (1999-2016). The New York Times' article database (1999-2016).

Data Analysis

Here's a graphical representation of the Average News Proportion/Average Deaths Proportion factors.

[In other words, a ratio of coverage vs actual death rates, with a taller line representing a greater difference between how often something is mentioned and how many people die from that cause.]



The most striking disparities here are that of kidney disease, heart disease, terrorism, and homicide. Kidney disease and heart disease are both about 10 times underrepresented in the news, while homicide is about 31 times overrepresented, and terrorism is a whopping 3900 times overrepresented. Kidney disease is a little surprising; we had guessed at the other three, but it was only by calculating the factor here that this disparity became visible.

Conclusion

We set out to see if the public attention given to causes of death was similar to the actual distribution of deaths. After looking at our data, we found that, like results before us, the attention given by news outlets and Google searches does not match the actual distribution of deaths.

This suggests that general public sentiment is not well-calibrated with the ways that people actually die. Heart disease and kidney disease appear largely underrepresented in the sphere of public attention, while terrorism and homicides capture a far larger share, relative to their share of deaths caused.

Though we have shown a disparity between attention and reality, we caution from drawing immediate conclusions for policy. One major issue we have failed to address here is that of tractability; just because a cause of death claims more lives does not mean that it is easily addressable.

A more nuanced look at which causes of mortality to prioritize would likely be with an evaluation framework.

Next>Thinking Clearly

Why is it sometimes difficult to think clearly and logically? Continue to learn about *cognitive biases* on the next page.

Class 1-2: Exploring Wellness

Thinking Clearly

Thinking Clearly

Do you ever feel like there is too much information out there?

Do you ever struggle to make sense out of the world around you?

Do you ever find that there just isn't enough time to figure everything out?

As you learned in the previous page, the types of threats we often fixate on - violence, terrorism, etc. - are far less likely to injure or kill us than commonplace things like vehicular collisions, heart disease, and bathroom slip-and-falls.

Just like lifting weights or running makes your muscles tired, thinking uses a lot of energy.

This leads to a tendency to take mental shortcuts: often resulting in illogical, false, or otherwise inaccurate conclusions.

We call these shortcuts *cognitive biases, errors, or distortions*.

Watch this brief video (~ 2 minutes) from the University of Texas to learn more about cognitive biases, how they can affect our judgment, and what we can do about them.

Metacognition and Biases

As you learned in the video above, everyone is susceptible to biases and errors in thinking - even highly skilled medical professionals.

While it isn't possible to always recognize and prevent them, being aware of cognitive biases can help us prevent them from skewing our judgments or taking actions based on bias, stereotypes, or flawed logic.

How can we become aware of these mental mistakes?

Next>Making Sense of Cognitive Bias

Class 1-2: Exploring Wellness

Making Sense of Cognitive Bias

Three Conundrums

On the previous page, you were asked three questions: Too much information? Too little sense? Too little time?

These three questions were developed by author Buster Benson, who realized that there are too many cognitive biases to ever be aware of at all times.

Until recently, the Wikipedia.org list of cognitive biases and effects was a mess, with over 175 listings and little order.

Wanting to make this information more accessible and digestible, Benson categorized these biases into three main problems (what he calls "conundrums") that our minds are trying to solve:

The following has been excerpted and adapted from Buster Benson's Pocket Biases and Cognitive Bias Cheat Sheet under fair use:

- CONUNDRUM 1: Information Overload
  - There seems to be too much information in the world, so our minds filter out a lot of it.

- CONUNDRUM 2: Need for things to Make Sense
  - The world seems very confusing and we have limited knowledge of it, but we need to make some sense of it in order to survive, so we connect the dots, fill in the gaps with stuff we already think we know, and make sure new information fits right in.

CONUNDRUM 3: Limited Time

> We have limited time, energy, and resources to learn and think, so we jump to conclusions and make choices based on them.

From these conundrums, he came up with 12 flawed strategies (shortcuts) that the cognitive biases tend to take to try to solve the problems:

> Shortcut 1: We have a limited capacity to notice and remember things, so we use the current context to help inform what we should be paying attention to.

> Shortcut 2: Things that we've recently thought about or been exposed to are primed in our heads and easier to access than things we haven't thought about in a while.

> Shortcut 3: Our brains boost the importance of things that are unusual or surprising, because they are more likely to be important. The bizarre things could be threats, or opportunities.

> Shortcut 4: When something new shows up, or something changes, our brains call that out to us because it might be important. In addition to the change, we get the direction of the change, which helps us figure out if it's good or bad.

> Shortcut 5: Another way to reduce the amount of information we have to think about is only paying attention to the parts that we think we'll need to remember later.

> Shortcut 6: We are really good at filling in gaps with generalities, stereotypes, and guesses to turn sparse data into meaningful stories. But we often can't tell which parts were the dots and which parts we filled in after the fact.

Shortcut 7: We imagine things and people we are familiar with or fond of as intrinsically better than things or people we aren't familiar with or fond of.

Shortcut 8: We simplify probabilities and numbers to make them easier to think about.

Shortcut 9: We generally assume that our experience is an objective view of reality, and will project our current mood, mindset, assumptions onto everything else.

Shortcut 10: We need to be confident in our ability to make an impact and to feel like what we do is important.

Shortcut 11: We're motivated to complete things that we've already invested time and energy into rather than change course.

Shortcut 12: When our beliefs are challenged, we'll often automatically react by defending them rather than questioning them.

Instead of Trying to Avoid Bias, Develop Honest Bias

In today's discussion, you'll look through his listing of cognitive effects and choose one to learn about in depth and share with your classmates.

For now, consider Buster's conclusions on what to do about the inherent human tendency toward bias:

These biases existed first in our brains, but you can also find them in the technology we use, in the institutions we've built, and the cultural norms we practice.

They're everywhere.

The best we can do is develop "honest bias".

I think of this as a dedication to remaining open to our own limitations, listening to evidence that contradicts our own beliefs, inviting diverse perspectives to the table, and begin willing to be uncomfortable with the fact that the universe is big, we are small, and there's no ultimate solution to any of this.

Our best hope is to reduce the time and energy we expend trying to maintain our blind spots when they're challenged.

Next>Emotions and Cognition

Class 1-2: Exploring Wellness

Emotions and Cognition

Thinking and Feeling

As we explored, thinking is complex, with much happening in our minds without our knowledge.

We as humans can easily be misled by errors or shortcuts in thinking, although we can limit how this affects our lives through awareness and metacognition.

While thinking is our most powerful tool for wellness, we have to use knowledge, awareness, and practice to ensure we are thinking logically and not acting based on irrational judgments and conclusions.

Is the same true of emotions?

Why do we have emotions?

Emotions are complex physiological processes that can often be overwhelming, unpleasant, or confusing.

Emotions have persisted throughout generations for a reason: perhaps because they are deep, instinctual tools that helped early humans navigate a difficult world.

Emotions appear to originate in deeper (older) regions of the brain than the more recently-developed regions that process thought.

Though there is much debate among scholars, one framework explains emotions as autonomic reactions to external stimuli - meaning they happen in response to things we sense and without our knowledge.

Later in the course, we will explore nutrition more.

For now, think about how people tend to crave salty, sugary, and fatty foods - even though broccoli and spinach are much better for us!

In a survival situation, salty, fatty, and sugary foods offer greater sources of energy and were therefore extremely desirable.

Though vegetables and other nutritious foods are now plentiful (if not always accessible, as we'll explore later), our instincts still seem to encourage us to eat salt, sugar, and fat in excess.

Being aware of this tendency, and how emotions relate to our instincts and thought processes, can help us make better choices about our wellness behaviors.

Though emotions offer us valuable information around the world around us, the signals aren't always clear.

For example, when presented with a new food they've never seen before, many people feel the emotion of "disgust."

This emotional response of disgust may have been helpful in the past, since it allowed early humans to avoid eating unfamiliar foods that might be dangerous.

Today, the emotion of 'disgust' still helps us determine if the week-old milk in the fridge is safe to drink, but it can also prevent us from trying new foods we may end up liking!

Just as we can be metacognitively aware of our thought processes to recognize and manage distortions, we can apply metacognition to our emotions.

Continue reading to learn questions and skills you can use to manage and benefit from your emotional experiences.

Next>Building Emotional Intelligence

With this understanding of emotions, continue to learn a metacognitive strategy for understanding and managing emotions in a healthy way.

Class 1-2: Exploring Wellness

Building Emotional Intelligence

The RU.L.E.R. method is a quick, reliable tool for practicing and developing emotional intelligence.

Review the following article linked below to learn how to practice R.U.L.E.R.:

Psychology Today: Building Emotional Intelligence Isn't as Hard as You Think

Next>How Many Emotions?

In this article, you learned how to begin to Recognize, Understand, Label, Express, and Regulate your emotions. On the next page, you'll learn about the spectrum of human emotion by seeing the findings of a research study that explored people's emotional reactions to short video clips.

Class 1-2: Exploring Wellness

How Many Emotions Do Humans Have?

How Many Different Human Emotions Are There?

Review the following article to learn about the researchers' findings about the complexity of emotion.

You may choose to open the interactive video map by clicking on the image below to see the videos used in the study and the emotional responses that the researchers found for each.

Note: Be aware that some of the videos linked on the interactive map may include graphic, violent, or otherwise intense content.

You are not required to visit the interactive map.

The following has been excerpted and adapted from Greater Good: How Many Different Human Emotions Are There? under fair use:

Greater Good Magazine
SCIENCE-BASED INSIGHTS FOR A MEANINGFUL LIFE

A new study identifies 27 categories of emotion and shows how they blend together in our everyday experience.

BY YASMIN ANWAR | SEPTEMBER 8, 2017

Using novel statistical models to analyze the responses of more than 800 men and women to over 2,000 emotionally evocative video clips, Keltner and his colleagues at UC Berkeley created a multidimensional, interactive map to show how feelings like envy, joy, pride, and sadness relate to each other.

"We found that 27 distinct dimensions, not six, were necessary to account for the way hundreds of people reliably reported feeling in response to each video," said

study senior author Keltner, whose findings recently appeared in *Proceedings of the National Academy of Sciences*.

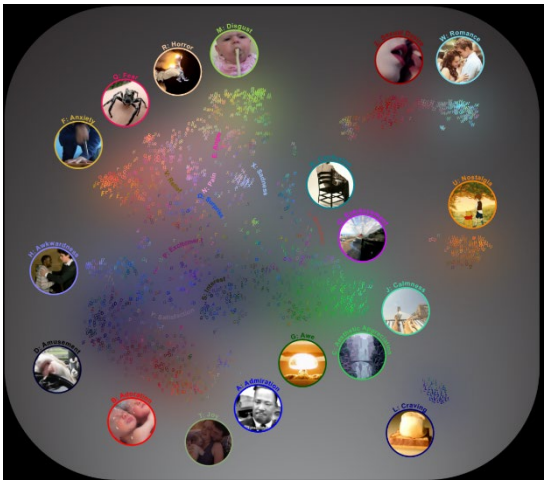
Moreover, in contrast to the notion that each emotional state is an island, the study found that "there are smooth gradients of emotion between, say, awe and peacefulness, horror and sadness, and amusement and adoration," Keltner said.

"We don't get finite clusters of emotions in the map because everything is interconnected," said study lead author Alan Cowen, a doctoral student in neuroscience at UC Berkeley. "Emotional experiences are so much richer and more nuanced than previously thought."

Through statistical modeling and visualization techniques, the researchers organized the emotional responses to each video into a semantic atlas of human emotions. On the map, each of the 27 distinct categories of emotion corresponds to a particular color.

"We sought to shed light on the full palette of emotions that color our inner world," Cowen said.

The 27 emotions include admiration, adoration, aesthetic appreciation, amusement, anger, anxiety, awe, awkwardness, boredom, calmness, confusion, craving, disgust, empathic pain, entrancement, excitement, fear, horror, interest, joy, nostalgia, relief, romance, sadness, satisfaction, sexual desire, surprise.



Next>Summary

Continue to the final page for this class to review what you've learned.

Class 1-2: Exploring Wellness

Summary

Major Points

During today's class, you have learned:

- The Seven Dimensions of Wellness
    - Physical - Making healthy decisions related to basic needs.
    - Emotional - Experiencing, expressing, and learning from the range of human feelings in a healthy way.
    - Intellectual - Engaging in life-long learning, developing critical thinking and seeking knowledge.
    - Spiritual - Having a core set of guiding principles that orient oneself to the world, respecting the core principles of others, and recognizing the shared humanity of all individuals.
    - Social - Building and maintaining healthy relationships based on trust and respect that are supportive and nurturing.
    - Environmental - Respecting and maintaining one's surroundings. Occupational - Finding fulfillment and satisfaction through work, continually developing one's abilities.
    - Financial - Having an awareness of financial literacy, managing one's finances in a way that provides peace of mind, and setting short- and long-term goals related to that aim.
    - Cultural - Understanding and appreciating one's own cultural background, recognizing how the experiences of all individuals may differ based on their cultural backgrounds, and respecting the diversity and perspectives of those individuals, their cultures, and their experiences. Sometimes viewed as part of Social or Spiritual Wellness.
    - As well, you have identified behaviors that support well-being in each category.
- Major Causes of Death
    - Heart disease is the leading cause of death for all Americans.
    - Other major causes are unintentional accidents, cancer, and suicide.
    - Media reporting often focuses on relatively rare instances of sensational causes of death.

- Cognitive Biases
    - Human thinking is bioenergetically expensive (it uses a lot of energy), creating a tendency for shortcuts.
    - These shortcuts can be unconscious (without our knowledge), often resulting in taking action based on false information.
    - Biases can present as false logic, stereotypes, generalizations, and other errors in logical thinking.
    - All humans are liable to experience cognitive biases and other forms of cognitive distortions.
    - Being aware of biases does not prevent them from affecting you, but to avoid allowing the bias or distortion to affect your judgment or action.
        - Metacognitive skills allow for better recognition and remediation (dealing with) of cognitive biases.
- Emotional Intelligence
    - Emotions appear to be primal, instinctual reactions to stimuli in our environment.
    - Emotions are often complex, can be unpleasant, and seem to arise without our control.
    - Ignoring or disregarding emotions does not appear to support long-term well-being.
    - Unrecognized emotions appear to affect perception, judgment, and behavior (without one's knowledge).
    - The R.U.L.E.R. method is a tool you can use for monitoring and addressing your emotional well-being.
        - Recognize
        - Understand
        - Label
        - Express
        - Regulate
    - Emotions may often be multilayered, with multiple emotional experiences occurring simultaneously.

Class 1-3: Strategies for Wellness

Overview

Today's Class Overview

In today's class, you will explore some evidence-based strategies that can help you as you work toward wellness across the dimensions.

Today's Class Objectives

By the end of this module you should be able to:

1. Describe how stress can be both beneficial and harmful.
2. Identify methods of managing stress to maintain a healthy balance.
3. Define mindfulness and explore how it can benefit well-being.
4. Explain how journaling can support lifetime wellness.
5. Recognize 7 characteristics of healthy relationships.
6. Connect the importance of sleep to mental and physical health and performance.

Outline of Today's Class

- Materials
    1. Overview
    2. Review
    3. What to Know about Stress
    4. Handling Life's Stressors
    5. What is Mindfulness?
    6. Metacognition and Mindfulness
    7. Journaling for Wellness
    8. Healthy Relationships
    9. Sleep for Success
    10. Summary

Next>Review Last Class

Class 1-3: Strategies for Wellness

Review

Reviewing 1-2: Exploring Wellness

Last class, you learned about:

- Wellness behaviors through seven dimensions of life.
- Major Causes of Death
    - Heart disease is the leading cause of death for all Americans.
    - Other leading causes are unintentional accidents, cancer, and suicide.
    - Media reporting often focuses on relatively rare instances of sensational causes of death.
- Cognitive Biases
    - Human thinking is bioenergetically expensive (it uses a lot of energy), creating a tendency for shortcuts.
    - These shortcuts can be unconscious (without our knowledge), often resulting in taking action based on false information.
    - Biases can present as false logic, stereotypes, generalizations, and other errors in logical thinking.
    - All humans are liable to experience cognitive biases and other forms of cognitive distortions.
    - Being aware of biases does not prevent them from affecting you, but to avoid allowing the bias or distortion to affect your judgment or action.
        - Metacognitive skills allow for better recognition and remediation (dealing with) of cognitive biases.
- Emotional Intelligence
    - Emotions appear to be primal, instinctual reactions to stimuli in our environment.
    - Emotions are often complex, can be unpleasant, and seem to arise without our control.
    - Ignoring or disregarding emotions does not appear to support long-term well-being.
    - Unrecognized emotions appear to affect perception, judgment, and behavior (without one's knowledge).
    - The R.U.L.E.R. method is a tool you can use for monitoring and

addressing your emotional well-being.
    - Recognize
    - Understand
    - Label
    - Express
    - Regulate
- Emotions may often be multilayered, with multiple emotional experiences occurring simultaneously.

Next>What to Know About Stress

We hear about stress all the time, but what is it? Read on to find out.

Class 1-3: Strategies for Wellness

Five Things to Know About Stress

The following has been excerpted and adapted from the NATIONAL INSTITUTE of MENTAL HEALTH under fair use:

5 Things You Should Know About Stress

Everyone feels stressed from time to time, but what is stress? How does it affect your overall health? And what can you do to manage your stress

Stress is how the brain and body respond to any demand. Any type of challenge such as performance at work or school, a significant life change, or a traumatic event—can be stressful. Stress can affect your health. It is important to pay attention to how you deal with minor and major stressors, so you know when to seek help. Here are five things you should know about stress.

1. STRESS AFFECTS EVERYONE.

Everyone experiences stress from time to time. There are different types of stress—all of which carry physical and mental health risks. A stressor may be a one-time or short-term occurrence, or it can happen repeatedly over a long time. Some people may cope with stress more effectively and recover from stressful events more quickly than others. Examples of stress include:

- Routine stress related to the pressures of school, work, family, and other daily responsibilities.
- Stress brought about by a sudden negative change, such as losing a job, divorce, or illness.
- Traumatic stress experienced during an event such as a major accident, war, assault, or natural disaster where people may be in danger of being seriously hurt or killed. People who experience traumatic stress may have very distressing temporary emotional and physical symptoms, but most recover naturally soon after.
- Read more about Coping With Traumatic Events (www.nimh.nih.gov/copingwithtrauma).

2. NOT ALL STRESS IS BAD.

In a dangerous situation, stress signals the body to prepare to face a threat or flee to safety. In these situations, your pulse quickens, you breathe faster, your muscles tense, and your brain uses more oxygen and increases activity—all functions aimed at survival and in response to stress. In non-life-threatening situations, stress can motivate people, such as when they need to take a test or interview for a new job.

3. LONG-TERM STRESS CAN HARM YOUR HEALTH.

Coping with the impact of chronic stress can be challenging. Because the source of long-term stress is more constant than acute stress, the body never receives a clear signal to return to normal functioning. With chronic stress, those same lifesaving reactions in the body can disturb the immune, digestive, cardiovascular, sleep, and reproductive systems. Some people may experience mainly digestive symptoms, while others may have headaches, sleeplessness, sadness, anger, or irritability.Over time, continued strain on your body from stress may contribute to serious health problems, such as heart disease, high blood pressure, diabetes, and other illnesses, including mental disorders such as depression (www.nimh.nih.gov/depression) or anxiety (www.nimh.nih.gov/anxietydisorders).

4. There are ways to manage stress.

If you take practical steps to manage your stress, you may reduce the risk of negative health effects. Here are some tips that may help you cope with stress:

- Be observant. Recognize the signs of your body's response to stress, such as difficulty sleeping, increased alcohol another substance use, being easily angered, feeling depressed, and having low energy.
- Talk to your health care provider or a health professional. Don't wait for your health care provider to ask about your stress. Start the conversation and get proper health care for existing or new health problems. Effective treatments can help if your stress is affecting your relationships or ability to work. Don't know where to start? Read our Tips for Talking With Your Health Care Provider (www.nimh.nih.gov/talking tips).
- Get regular exercise. Just 30 minutes per day of walking can help boost your mood and improve your health.

- Try a relaxing activity. Explore relaxation or wellness programs, which may incorporate meditation, muscle relaxation, or breathing exercises. Schedule regular times for these and other healthy and relaxing activities.
- Set goals and priorities. Decide what must get done now and what can wait. Learn to say “no” to new tasks if you start to feel like you’re taking on too much. Try to be mindful of what you have accomplished at the end of the day, not what you have been unable to do.
- Stay connected. You are not alone. Keep in touch with people who can provide emotional support and practical help. To reduce stress, ask for help from friends, family, and community or religious organizations.
- Consider a clinical trial. Researchers at the National Institute of Mental Health (NIMH) and other research facilities across the country are studying the causes and effects of psychological stress as well as stress management techniques.
- You can learn more about studies that are recruiting by visiting www.nimh.nih.gov/joinastudy or www.clinicaltrials.gov (keyword: stress).

5. IF YOU FEEL OVERWHELMED BY STRESS, ASK FOR HELP FROM A HEALTH PROFESSIONAL.

You should seek help right away if you have suicidal thoughts, are overwhelmed, feel you cannot cope, or are using drugs or alcohol more frequently as a result of stress. Your doctor may be able to provide a recommendation. You can find resources to help you find a mental health provider by visiting www.nimh.nih.gov/findhelp.

CALL THE NATIONAL SUICIDE PREVENTION LIFELINE

Anyone can become overwhelmed. If you or a loved one is having thoughts of suicide, call the confidential toll-free National Suicide Prevention Lifeline at 1-800-273-TALK (8255), available 24 hours a day, 7 days a week. Lifeline chat is available at https://suicidepreventionlifeline.org.The service is available to everyone.www.nimh.nih.gov NIH Publication No. 19-MH-8109

The following has been excerpted and adapted from Cornell University's "Tips and Information to Help You Thrive" under fair use:

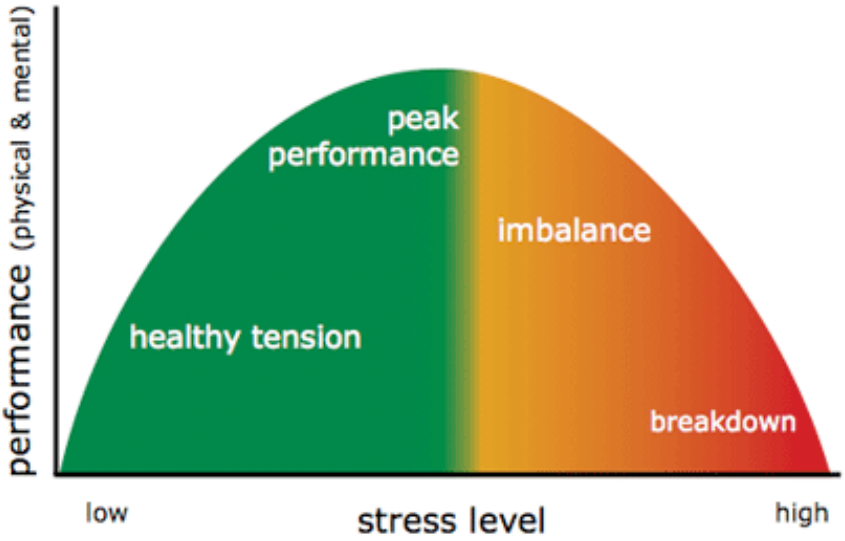
The Stress Continuum

Stress is our automatic response to demands, pressures, and/or competing priorities in our life.

Not all stress is bad. Some stress can motivate us and help us focus on achieving our goals. But **too much stress**, or stress carried too long, can activate our "fight or flight" response … which, if left unchecked, can decrease our ability to function in one or more areas of our life.

As a college student, stress is unavoidable. The goal isn't to try to get rid of all stress. Rather, the goal is to learn to respond well to stress. This means balancing your daily stressors with the activities and attitudes that replenish the physical, mental, and emotional energy lost to stress.

Consider this stress continuum graph showing the relationship between our performance / functioning and our stress level:



1. **Healthy tension (green zone):** Moderate stress is appropriate sometimes. It helps us focus on studying for a test, or turning in a paper on time. It motivates us to do our best. When we experience "good" stress, we feel challenged, but in control, as we work toward accomplishing our goals.

2. **Peak performance zone (top of curve):** In order to achieve our personal best – academically, or otherwise – we need to be well-prepared physically, mentally, and emotionally. This comes

from a place of healthy tension (green zone), balanced with self-care practices that bolster resilience.

3. **Imbalance (yellow zone):** When daily pressures build and self-care falls by the wayside, we can experience irritability, fatigue, aches and pains, sleep problems, and a decline in focus and academic performance. But it's not too late to move back to the healthy tension zone. Rising stress can be brought back down to a more manageable level through stress management techniques and resilience-building (see below).

4. **Breakdown (red zone):** When stress is left unchecked, symptoms can worsen, causing forgetfulness, serious physical complaints, illness, and feelings of anxiety, panic, and/or depression. When breakdown occurs, support and assistance from others is crucial to help us recover.

Next>Healthy Ways to Handle Life's Stressors

Class 1-3: Strategies for Wellness

Handling Life's Stressors

The following has been excerpted and adapted from the American Psychological Association's Guide on Stress under fair use:

AMERICAN PSYCHOLOGICAL ASSOCIATION

Healthy ways to handle life's stressors

Stressful experiences are a normal part of life, and the stress response is a survival mechanism that primes us to respond to threats. Some stress is positive: Imagine standing in front of a crowd to give a speech and hitting it out of the park. Stressful? Certainly. But also challenging and satisfying.

But when a stressor is negative and can't be fought off or avoided — such as layoffs at work or a loved one's medical crisis — or when the experience of stress becomes chronic, our biological responses to stress can impair our physical and mental health.

Fortunately, there are many evidence-based tools to help combat the negative effects of stress in healthy ways. They recommend that you:

Try to eliminate the stressors: Whether or not you experience an intolerable level of psychological stress depends on the intensity of the situation and also the person experiencing it. How you perceive and think about a stressor can also make a big impact on how you respond. It's not always possible to escape a stressful situation or avoid a problem, but you can try to reduce the stress you are feeling. Evaluate whether you can change the situation that is causing you stress, perhaps by dropping some responsibility, relaxing your standards or asking for help.

Cultivate social support: Strong social support can improve resilience to stress.[1] Reach out strategically. Some friends or family members may be good at listening and sympathizing. Others might excel at practical help, like bringing over a home-cooked meal or covering an hour of child care. *Giving* support can also increase

positive emotions and decrease negative emotions.[2] Just make sure your relationships stay in balance. A friend who requires support but never gives it may increase your stress level.

Seek good nutrition: When confronted with a stressor, the central nervous system releases adrenaline and cortisol, which affects the digestive tract among other physiological changes. Acute stress can kill the appetite, but the release of the hormone cortisol during chronic stress can cause fat and sugar cravings. Research also suggests that high cortisol combined with high sugar consumption may prompt the deposition of fat around our internal organs[3] — visceral fat that is associated with cardiovascular and metabolic diseases. A diet high in a variety of nutrients can both protect health and provide more physical energy to deal with challenges. No need to go vegan or swear off cookies —just aim to consume a rainbow of fruits and vegetables as part of your daily diet. Avoid using substances such as alcohol to dampen the stress response since substances do not solve the root of the problem and can have serious health effects.

Relax your muscles: Because stress causes muscles to tense, being stressed out can create tension headaches, backaches and general fatigue. Combat stress and these symptoms with stretches, massage or warm baths. Or try progressive muscle relaxation, a method that has been shown to reduce anxiety and improve overall mental health.[4] To practice progressive muscle relaxation, get in a comfortable position and choose a muscle group, like your lower leg muscles (most practitioners recommend starting with the lower body and working your way up). Inhale and contract the muscles for five to 10 seconds, then exhale and release the muscles suddenly. Relax for 10 or more seconds and then move on to the next muscle group. Another option is passive progressive muscle relaxation. This technique is similar to progressive muscle relaxation but skips the tensing step. Instead, simply picture each muscle group one at a time and focus on relaxing that portion of the body.

Meditate: A strong body of research shows that mindful meditation can reduce psychological stress and anxiety — even short-term mindfulness meditation programs work.[5] To get started, set aside five minutes in a quiet place to sit and breathe. Focus on the present moment; if stray thoughts intrude, acknowledge them and then let them go. Don't judge yourself for any mental wavering. Gently refocus and bring the attention back to the present moment.

Protect your sleep: Daytime stress affects nighttime sleep.[6] Making matters worse, losing shuteye can affect both cognition and mood. How to sleep better? Try to have a consistent sleep routine that allows time to wind down before lights out. Meditation and relaxation can help with insomnia.[7] Also, avoid caffeine and alcohol in the late afternoon and evening. Put down your screens, as blue light can suppress the sleepy hormone melatonin (and checking social media may ramp up your emotions.) Finally, move your body during the day: A large body of research suggests that physical activity can improve sleep, especially for middle-aged and older adults.[8]

Get physical: Brisk movement can not only improve sleep, it can directly combat stress. In one study, working adults who participated in moderate physical activity had half the perceived stress as working adults who did not participate.[9] Physical activity may also cancel out some of the negative effects of stress, including the impact of stress on the immune system.[10] Adding physical activity needn't be expensive or complex: A brisk 30-minute walk or a dance session in the living room can do the trick.

Take a moment in nature: Studies conducted in multiple countries have found that green space improves mood.[11] Even nature videos can speed the recovery from stress compared with videos of urban scenes.[12] Taking a moment to notice nature — even in the form of a bustling city park — can refocus and calm your mind.

Keep your pleasurable activities: When life gets overwhelming, people often drop their leisure activities first. But cutting yourself off from pleasure can be counterproductive. Even when time is tight, look for opportunities to do something for yourself, whether that means reading a novel, singing along to your favorite tunes or streaming your favorite comedy on Netflix. Humor and laughter can benefit both mental and physical health.[13]

Reframe your thinking: One of the most research-supported treatments for stress and anxiety is cognitive behavioral therapy, or CBT. At the root of this therapy approach is the understanding that our thoughts influence our emotions, which in turn influences our behaviors. Reframing your thoughts around a stressor can help manage your emotions, reducing feelings of stress.[14] Some tips: If you feel yourself spiraling into imagining worst-case scenarios, stop and put your mind elsewhere. Set realistic expectations for yourself. Strive for acceptance of situations outside of your control.

Seek help: If you feel overwhelmed and self-help isn't helping, look for a psychologist or other mental health provider who can help you learn how to manage your stress effectively. He or she can help you identify situations or behaviors that contribute to your stress and then develop an action plan to change the stressors, change your environment and change your responses.

Next>What does it mean to be Mindful?

You may have heard that you should be mindful to manage stress and support your well-being. What does "mindful" mean?

Class 1-3: Strategies for Wellness

What is Mindfulness?

What Is Mindfulness?

As a young medical professional in the 1970s, Dr. Jon Kabat-Zinn began looking for ways to help patients manage their pain. His research and work inspired the modern conception of mindfulness, which he describes in the following way:

"Mindfulness is awareness that arises through paying attention, on purpose, in the present moment, and non-judgmentally."

While this is a simple idea, over the last four decades mindfulness practices have accumulated a still-growing body of evidence supporting the following benefits:

- Decreases in depression and anxiety.
- Better management of stress, pain, and mental distress.
- Enhanced quality of life over the lifespan.
- Improved attention, self-awareness, emotional control, and cognitive performance.

See a summary of the body of evidence for mindfulness in this report put out by the U.S. Department of Veterans Affairs.

Watch this 3-minute video from the University of Minnesota to learn more about mindfulness.

The following has been excerpted and adapted from the University of Minnesota's Taking Charge of your Health and Wellbeing under fair use:

How Can Mindfulness Support Wellness?

Simple as it may sound, mindfulness transforms how we relate to events and experiences. It creates a more spacious way of being in the world that is less reactive and generally happier.

MINDFULNESS IS DIFFERENT FROM OUR DEFAULT MODE

Developing a steady and non-reactive attention is often radically different from the way we are in the world.

Many of us spend large parts of our lives on auto pilot, not aware of what we are experiencing, missing out on all the sights and sounds and smells and connections and joys we could appreciate. Some of that time our minds seem "switched off," and other times caught in thoughts from the past (often regrets) or plans for the future, much of which is repetitive.

When we do notice something in the present, our habit is often to judge instantly and react quickly, often working from a faulty or limited perspective that restricts our options or creates issues.

Mindfulness helps us be present in our lives and gives us some control over our reactions and repetitive thought patterns. It helps us pause, get a clearer picture of a situation, and respond more skillfully.

Mindfulness is not always easy because other experiences (thoughts, feelings, physical discomfort) naturally arise and can pull our attention away. But with practice, our skill increases, and we can pay attention to our chosen object without getting lost in other experiences. And we find that we can also simultaneously notice any underlying reactivity, such as annoyance or frustration.

Exploring Further

You may choose to explore further using the following links to the University of Minnesota's Taking Charge of your Health and Wellbeing website:

- How to Begin with Mindfulness
- How Does Mindfulness Work?
- Mindfulness for Stress Reduction
- Mindfulness for Pain
- Mindfulness and Racial Justice
- Mindfulness in Education
- Sources for Guided Meditation

Next>S.T.O.P. to Create Space Around Automatic Reactions

Mindfulness can take many forms beyond sitting and breathing, such as walking, praying, and even eating. Continue reading to learn one simple, quick way to bring a mindful approach to your day.

Class 1-3: Strategies for Wellness

S.T.O.P. for Mindfulness and Metacognition

Mindfulness and Metacognition Work Together

Reflecting on our course, recall that metacognition is the faculty and skill of thinking about our thoughts, our learning, and our behaviors.

Mindfulness allows us to step back from what we are experiencing, helping make the space to explore and apply metacognitive strategies.

These two faculties - thinking intentionally and "being" intentionally - can be used together to support your wellness.

Read on to learn one basic approach for applying mindfulness and metacognition in your day-to-day life.

The following has been excerpted and adapted from the Mindful.org article The S.T.O.P. Practice under fair use:

The S.T.O.P. Practice: Creating Space Around Automatic Reactions

Rhonda Magee takes us through this simple portable mindfulness practice she uses to find calm when difficult moments arise.

This “portable” mindfulness practice can support you as difficult moments arise at any point in your day. The four steps of the STOP practice can take as little as a few seconds to a few minutes to complete. Try it out and see how long you prefer doing each step.

S

To begin, the “S” stands simply for **stop**. Literally. Just stop what you’re doing, whether it is typing or rushing out the door. Give yourself a moment to come to rest, pause, and collect yourself.

T

The “T” stands for **take** a conscious breath. Now that you’ve paused, take a deeper breath, or two, allowing yourself to feel the expansion of the belly as you breathe deeply. Notice the sensations of being here, now. As you do so, it may help to bring your attention to the sensations of your feet meeting the floor. Feel the support of the ground and of your own relaxing breath as you do so.

O

The “O,” stands for **observe** what’s arising in you, including any thoughts, emotions, or bodily sensations (such as tension, butterflies, tightness in the jawline). Broaden your awareness to take in the circumstances. Notice how you can be in this situation without being ruled by it. For added support, offer self-compassion as you release tension and stressful thoughts. As you calm down, open to the choices you have in terms of how best to move forward from here.

P

Finally, the “P” reminds you to simply **proceed** with intentionality, taking the next step in your day from this place of strength, wisdom, and presence.

Next>Journaling for Wellbeing

While the S.T.O.P. acronym is easy to use in small moments throughout the day, sitting down to reflect on your experiences offers benefits too. Read on to learn about them!

Class 1-3: Strategies for Wellness

Journaling for Wellness

Journaling is an easy-to-incorporate wellness behavior that is supported by the research.

Review the following article linked below to learn about how journaling can support well-being.

Michigan State University - Journaling to Reduce Covid-19 Stress

The following has been excerpted and adapted from the University of Rochester's Health Encyclopedia entry "Journaling for Mental Health" under fair use:

How to journal

Try these tips to help you get started with journaling:

Try to write every day. Set aside a few minutes every day to write. This will help you to write in your journal regularly.
Make it easy. Keep a pen and paper handy at all times. Then when you want to write down your thoughts, you can. You can also keep a journal on your smartphone.
Write or draw whatever feels right. Your journal doesn't need to follow any certain structure. It's your own private place to discuss and create whatever you want to express your feelings. Let the words and ideas flow freely. Don't worry about spelling mistakes or what other people might think.
Use your journal as you see fit. You don't have to share your journal with anyone. If you do want to share some of your thoughts with trusted friends and loved ones, you could show them parts of your journal.

Next>Healthy Relationships

The S.T.O.P. acronym and journaling are both tools that can help us become more aware of situations in our lives. Continue to the next page to learn about healthy relationships and how we can apply these concepts of mindfulness and metacognition to our experiences with others.

Class 1-3: Strategies for Wellness

Healthy Relationships

The Importance of Relationships

Thinking back to Maslow's Hierarchy of Needs, our relationships with others provide the foundation for our emotional, social, and psychological needs.

Unfortunately, relationships - whether with family, friends, teachers, community members, or partners - can be difficult to navigate.

Fundamentally, our relationships with others should support us in our well-being and challenge us in healthy and productive ways.

How do we know what that looks like?

Below, you'll learn about the "7 C's of Healthy Relationships."

Though this list focuses specifically on romantic partnerships, the same expectations are healthy in other interpersonal relationships as well.

The following has been excerpted and adapted from the University of Texas at Austin's Voices Against Violence page under fair use:

The 7 C's of Healthy Relationships

Conflict resolution – The ability to find a peaceful solution to a disagreement. Conflict resolution does not mean one person always gets their way - no one should feel pressured to compromise their values or boundaries. Conflict resolution also does not mean that conflicts are "bottled up" or not addressed. For more information about navigating conflict resolution, visit fighting fair.

Checking In – Paying attention to each other's needs and taking each other into account when making decisions that affect both of you. It is also important to check in with yourself and assess if you feel safe, comfortable and respected in your relationship.

Consent – An enthusiastic, mutual agreement that can be revoked at any time for any reason and is necessary in all sexual interactions. Consent is

also important in contexts other than sexual activity, including other kinds of physical intimacy (like hugs) and for virtual activity like sharing sexual texts or images. For more, visit Consent.

Courage – Choosing to address difficult topics and hear feedback and being open and being open and honest about your feelings and needs. Courage can also include being an ally for partners and friends who are experiencing bias incidents or other incidents of harm – to read more about bystander intervention, visit BeVocal. Practicing courage does not mean putting yourself in situations where you feel unsafe or might experience harm.

Compassion – Thoughtfulness and sensitivity toward others and a desire to reduce distress and provide support. Practicing compassion does not require fixing others' problems or always agreeing with others.

Celebration – Appreciation for each other and your relationship. Celebration includes excitement about each other's hopes, dreams, and accomplishments and appreciation of each person's uniqueness. Take time to learn how each partner prefers to celebrate and be celebrated.

Communication – Expressing needs, wants and feelings and listening for the purpose of understanding.

Love is Respect

Love is Respect is an initiative of the National Domestic Violence Hotline that offers information and support to young people as they learn about romantic relationships.

The website offers answers to many common questions about relationships.

Grief

Grief is the natural human experience of loss and an inevitable part of life.

Grief is not predictable, simple, or uniform. Each person's experience is unique.

While we often think of grieving a loved one, we can also experience grief over other losses.

We can grief the loss of normalcy, as you may have during the beginning of the pandemic in early 2020.

Indeed any change - such as losing a job, realizing you've grown apart from a friend, receiving a medical diagnosis, or enduring a miscarriage - can bring grief.

Grief can manifest in seemingly endless ways, such as a feeling of numbness, intense and conflicting emotions, or difficulty concentrating.

As a college student, questions about balancing your academic progress and processing grief can cause particular distress.

There is no timeline, "right way," or other set method of grieving. The creator of the "Five Stages of Grief" model did not intend it to be seen as a linear process.

Grief is not an orderly process and your experience of grief will be unique.

➡ Visit the Hospice Foundation's page on "What is Grief" for more information.

Next>Sleep

When you've got so much to do and so little time, sleep can sometimes feel like a burden. Continue to learn how making sleep a priority makes your days easier and healthier.

Class 1-3: Strategies for Wellness

Sleep for Success

The following has been excerpted and adapted from the University of North Carolina at Chapel Hill's "Sleeping to Succeed" under fair use and CC-A-NC-ND-4.0:

Sleeping to Succeed

Ernest Hemingway is said to have once remarked, “I love sleep. My life has a tendency to fall apart when I’m awake.” Whether you have it all together during the day or feel more like Hemingway, we all benefit from healthy sleep habits. Sleep promotes cognition and memory, facilitates learning, recharges our mental and physical batteries, and generally helps us make the most out of our days. With plentiful sleep, we improve our mental and physical health, reduce stress, and maintain the routine that is critical to healthy daily functioning.

Within the busy schedules of college students, sleep is often the first thing to go when trying to squeeze in all of the academic, social, and extracurricular activities that are often part of campus life. And when you’re taking online classes remotely, you may find yourself catching up on asynchronous course content at any hour of day or night while the rest of the household sleeps. This handout discusses why it is important to maintain healthy sleep habits and provides tips and tricks on how to do it!

Why is sleep so important?

Sleep plays a critical role in helping our bodies and minds recover and rejuvenate. As a result, sleep contributes to improvements in learning and promotes regulatory functions such as emotional and behavioral control that are important for each and every day. Some examples of physiological and behavioral benefits of sleep include:

- Improving our ability to learn new information and form memories
- Restoring neural connections
- Assisting in optimal emotional control, decision making, and social

interaction

How much sleep do you need?

The optimal amount of sleep for each person may vary, but generally research suggests 7-9 hours per night for college-aged populations.

How much sleep are college students getting?

As you might guess, most college students do not get the recommended amount of sleep necessary to maximize its benefits. Sleep is particularly important for college students because sufficient sleep has been linked to increases in GPA! Research has found:

> 50% of college students report daytime sleepiness, and 70% report insufficient sleep.
> The GPAS of students receiving 9+ hours of sleep per night were significantly higher (3.24) than those of students receiving 6 or fewer hours of sleep per night (2.74).

What if you're not getting enough sleep?

Because sleep plays such a crucial role in human functioning, lack of sleep can lead to a number of consequences affecting behavior, memory, emotions, and learning when we are awake. These consequences can include:

- Inattention, irritability, hyperactivity, poor impulse control and difficulty multi-tasking
- Impaired memory
- Impaired math calculation skills

In extreme sleep deprivation, consequences can even include mood swings and hallucinations.

When we do not get the sleep we need, our bodies do not forget; we go into sleep debt. Our bodies continue to pay back this debt by trying to get sleep whenever possible, which can result in microsleeps.

> You may not notice inadvertent sleeping during the day (even in class or when studying!) that can last just seconds. These

microsleeps impede concentration and negatively impact retention of information.

Additionally, individuals often use caffeine or others stimulants to stay awake. This not only puts them at risk for the consequences of poor sleep, but also the negative health effects of increased stimulant consumption.

What types of things affect falling and staying asleep?

Sleep can be affected by a number of things including how we treat our bodies, what we put in our bodies, and how we interact with our environment:

- Caffeine
- Screen light
- Sleep routines (regular bedtime)
- Exercise
- Diet
- Decongestant stimulants and/or diet pills
- Nicotine
- Alcohol

Although alcohol may help you fall asleep because it is a depressant, it reduces sleep stages II, IV, and REM, which are the restorative sleep stages.

How to optimize your sleep

Given what we know about sleep, there are a number of things you can do and avoid to improve your sleep cycle. This list is not exhaustive, but it includes many suggestions that help in falling and staying asleep so you can get the 7-9 hours your body and mind need.

THINGS YOU MAY WANT TO TRY

- Allow yourself enough time to sleep.
- Gradually set earlier bedtimes when attempting to adjust your sleep cycle.
- Expose yourself to bright light in the morning to help wake up.
- Keep your bedroom cool, dark, and quiet to help fall asleep.
- Exercise regularly but not right before bed.
- Maintain a regular sleep routine on weekdays and weekends.

- Relax yourself as much as possible before bed. This can include taking a warm bath, meditating, or reading something that is not cognitively taxing.
- Re-evaluate your daily schedule and make time for 7-9 hours of sleep every night.
- Prioritize and protect your sleep time. Find a friend who can help keep you accountable for going to sleep at your goal bedtime each night.
- Structure your day and plan ahead on your exams, assignments, due dates, and activities so that you don't have to end up cramming or working late into the night. Use a weekly calendar and/or a priorities list to help take control of your to do lists and better manage your time to prioritize sleep.
- Make an appointment with an academic coach to talk one-on-one about your schedule, sleep habits, and study habits and how to manage your time to prioritize sleep.

THINGS YOU MIGHT WANT TO CUT OUT

- Don't use alcohol to help fall asleep. While this may help fall asleep, you may be more likely to have difficulty staying asleep as alcohol can disrupt the natural cycle of sleep, and the sleep may be less restorative.
- Don't eat large meals right before bed.
- Don't engage in rigorous exercise before bed.
- Don't use nicotine. Nicotine is a stimulant, and daytime use can inhibit sleep.
- Don't drink caffeine within 8hrs of your intended bedtime.
- Don't expose yourself to bright lights before going to bed.
- Don't use electronic devices that give off light such as TV, computer, phones, etc. before bed. This light inhibits the secretion of melatonin making it more difficult to fall asleep.

Next>Summary

Class 1-3: Strategies for Wellness

Summary

Major Points

During today's class, you have learned:

- Stress is the response of the mind and body to demands.
    - Stress can be beneficial or negative depending on our ability to manage and adapt to it.
    - Stress can have physical effects on the body, especially chronic stress.
    - Stress can motivate performance up to a certain point, after which performance declines.
    - Stress can be managed in many ways, such as:
        - Social Support
        - Good Nutrition
        - Relaxation Exercises and Meditation
        - Adequate, Quality Sleep
        - Physical Activity
        - Time in Nature
        - Activities you Enjoy
        - Counselors and other health providers
- "Mindfulness is awareness that arises through paying attention, on purpose, in the present moment, and non-judgmentally."
    - Mindfulness is not a technique or practice, but a state of being.
    - To be mindful is to see the world as it is, avoiding the types of preconceived judgments (cognitive distortions) we explored earlier.
    - Mindfulness activities can take many forms, such as breathing, walking, eating, or praying.
        - Difficulty in being mindful is a normal and helpful part of developing mindfulness.
    - S.T.O.P. for Mindfulness and Metacognition
        - **Stop** and take a moment.
        - **Take** a conscious breath or two to relax the nervous system.
        - **Observe** what is happening in your body at a distance.
        - **Proceed** with your next step from a place of intention and relative calm.

- Journaling
    - Researchers have shown that journaling can contribute to health and success
    - Journaling can:
        - Reduce stress
        - Provide a safe place for emotions
        - Improve physical health
        - Help with problem solving
        - Provide perspective
- Healthy relationships are built on respect.
    - Love is Respect.org is a resource for learning about healthy relationships.
    - 7 C's of Healthy Relationships:
        - Conflict Resolution
        - Checking In
        - Consent
        - Courage
        - Compassion
        - Celebration
        - Communication
    - Grief is a natural experience of loss.
        - There are no standards for grieving and each person's experience of grief is unique.
        - Resources are available to help you as you encounter and process grief.
- Sleep is a survival need.
    - Inadequate sleep can inhibit your ability to learn, make decisions, and exhibit self-control.
    - Adequate sleep supports learning and performance.
    - Tips
        - Plan enough time for sleep. Structure your day so you do not need to stay up late to do schoolwork.
        - Keep your bedroom cool, dark, and quiet.
        - Exercise regularly but not right before bed.
        - Lean into your biology by maintaining a regular schedule, avoiding bright lights before bed, and using bright lights to wake up.

Class 1-4: Barriers to Wellness

Overview

Today's Class Overview

In today's class, you will learn about the barriers that often prevent individuals from maintaining their health, meeting their needs, and working towards well-being across the dimensions.

Today's Class Objectives

By the end of today's class, you should be able to:

1. Define the Built Environment.
2. Identify major Social Determinants of Health.
3. Explain the "Health Gradient" and how it relates to personal health and wellness behaviors.
4. Discuss how communities can support personal wellness behaviors.
5. Define "Health Literacy" and explore how individuals navigate their health care.
6. Connect with resources for mental health support.

Outline of Today's Class

- Materials
    1. Overview
    2. Review Last Class
    3. Wellness and the Shared Environment
    4. Social Determinants of Health
    5. The Health Gradient
    6. Health Literacy and Self Advocacy
    7. Mental Health
    8. Summary

Next>Review Last Class

Class 1-4: Barriers to Wellness

Review

Reviewing 1-3: Strategies for Wellness

- Stress is the response of the mind and body to demands.
    - Stress can be beneficial or negative depending on our ability to manage and adapt to it.
    - Stress can have physical effects on the body, especially chronic stress.
    - Stress can motivate performance up to a certain point, after which performance declines.
    - Stress can be managed in many ways.
- "Mindfulness is awareness that arises through paying attention, on purpose, in the present moment, and non-judgmentally."
    - Mindfulness is not a technique or practice, but a state of being.
    - To be mindful is to see the world as it is, avoiding the types of preconceived judgments (cognitive distortions) we explored earlier.
    - Mindfulness activities can take many forms, such as breathing, walking, eating, or praying.
        - Difficulty in being mindful is a normal and helpful part of developing mindfulness.
    - S.T.O.P. for Mindfulness and Metacognition
        - **Stop** and take a moment.
        - **Take** a conscious breath or two to relax the nervous system.
        - **Observe** what is happening in your body at a distance.
        - **Proceed** with your next step from a place of intention and relative calm.
- Journaling
    - Researchers have shown that journaling can contribute to health and success.
    - Journaling can:
        - Reduce stress
        - Provide a safe place for emotions
        - Improve physical health
        - Help with problem solving
        - Provide perspective
- Healthy relationships are built on respect.

    - Love is Respect.org is a resource for learning about healthy relationships.
    - 7 C's of Healthy Relationships:
        - Conflict Resolution
        - Checking In
        - Consent
        - Courage
        - Compassion
        - Celebration
        - Communication
    - Grief is a natural experience of loss.
        - There are no standards for grieving and each person's experience of grief is unique.
        - Resources are available to help you as you encounter and process grief.
- Sleep is a survival need.
    - Inadequate sleep can inhibit your ability to learn, make decisions, and exhibit self-control.
    - Adequate sleep supports learning and performance.

Next>What is the Built Environment?

Class 1-4: Barriers to Wellness

What is the Built Environment?

In 2006, UCLA Professor Emeritus Doctor Richard Joseph Jackson spoke with Metropolis Magazine about an eye-opening experience on his way to the Centers for Disease Control and Prevention in Atlanta, Georgia, two hours north of Columbus State University.

The following is adapted and excerpted from the British Columbia Provincial Health Services Authority's "Foundations for a Healthier Built Environment" Report under fair use:

One Hot Day on Buford Highway in Atlanta, Georgia

> "The head of the CDC invited his dozen directors to the central office to work on a paper about the ten leading diseases of the twenty-first century.
>
> I'm driving over there, and as always I'm thinking about pesticides, herbicides, cancer, and birth-defect clusters—you name it.
>
> I'm late, stuck in traffic on Buford Highway, voted one of the ten worst streets in North America.
>
> It's a seven-lane road surrounded by garden apartments, mainly for poor immigrants, with no sidewalks and two miles between traffic lights.
>
> It's 95 degrees out, 95 percent humidity. I see a woman on the right shoulder, struggling along, and she reminds me of my mother.
>
> She's in her seventies, with reddish hair and bent over with osteoporosis.
>
> She has a shopping bag in each hand and is really struggling.
>
> If that poor woman had collapsed from heat stroke, we docs would have written the cause of death as 'heat stroke' and not lack of trees and public transportation, poor urban form, and heat-island effects.
>
> If she had been killed by a truck going by, the cause of death would have been 'motor-vehicle trauma,' and not lack of sidewalks and transit, poor urban planning, and failed political leadership.

> That was the ‘aha!’ moment for me. Here I was focusing on remote disease risks when the biggest risks that people faced were coming from the built environment.”

What is The Built Environment?

As he explains, the simple answer of "heat stroke" has many factors that underlie it - the lack of shade that trees can provide over walkways, for instance, and the decisions behind the placement of those roads and businesses. Just as our behavior is often directed by our needs, the choices and opportunities available are often determined by our surroundings.

> The phrase ‘built environment’ refers to the surroundings that we humans have created.
>
> These surroundings include both indoor and outdoor places and vary from large-scale urban areas to smaller rural development and personal spaces.
>
> Recently, there is a growing understanding about how the choices we make about our built environment impact health.
>
> Consider, for instance, the distances people must travel to work, the convenience of buying healthy foods, or the safety of a park: all of these factors can promote good nutrition and physical activity, leading in turn to better mental and physical health.
>
> See Figure 2 (below)

Figure 2: Health Impacts in our Neighbourhoods[8]

Having well-designed homes, sidewalks, transportation systems and playgrounds promotes activity for all ages.

For instance, we know that urban environments that lack public gathering places encourage sedentary habits, while attractive parks and open spaces create opportunities for exercise; Protection from physical injuries [while being active] is a key concern of parents and of the elderly.

Other examples [of how the built environment can encourage physical activity] would be reducing the speed of vehicular traffic and providing safe cycling and walking routes.

People want to live in places where they are able to be active and are also more likely to walk when land use is mixed (i.e., locating shops, schools, and workplaces close to homes).

According to the World Health Organization, 80% of some chronic diseases can be prevented.

The global rise in childhood asthma, for instance, is attributed to poor air quality from industrial activity and vehicle emissions.

Diabetes and cardiac disease are related to obesity and physical inactivity.

These conditions in which people live and work are sometimes called 'the causes behind the causes' of ill health.

Many cannot be tackled directly by our health care system.

Even more basic, the lack of safe, affordable housing severely impacts health, with the most marginalized – such as people living with mental illness – suffering the worst effects.

We know that walking and biking to school have become much rarer, in part because of planning and investment policies (approvals for new development are not tied to spending to improve pedestrian and bicycle infrastructure), urban form patterns (school sites are not easy for children to walk or bike and because our communities are not built to support those activities).

The result on individual behaviour?

Only 10% of students use active transport to get to school.

The result on population health?

Thanks to rising obesity rates – what some call the new tobacco – we're faced with the very real possibility that the current generation of children may actually be the first to have a lower life expectancy than their parents.

The interior design of homes, schools, workplaces and other buildings also affects health.

For example, public buildings can encourage physical activity with attractive, convenient staircases.

Well designed schools improve children's educational achievement. However, indoor environments can also have negative effects such as when harmful substances contaminate indoor air and cause respiratory diseases such as asthma.

Personal space, temperature, lighting, humidity and noise are other factors of the indoor built environment that affect health in different ways.

In sum, personal health behaviors are made easier by supportive settings that promote healthy human habitats and healthy social interaction: access to recreation, schools, jobs, health and social care, strong social networks, good air and water quality, and opportunities for physical activity.

Next>Social Determinants of Health

Class 1-4: Barriers to Wellness

Social Determinants of Health

The following has been excerpted and adapted from the U.S. Department of Health and Human Services' "Healthy People 2030 - Social Determinants of Health" page under fair use:

What are social determinants of health?

Social determinants of health (SDOH) are the conditions in the environments where people are born, live, learn, work, play, worship, and age that affect a wide range of health, functioning, and quality-of-life outcomes and risks.

SDOH can be grouped into 5 domains:

Economic Stability

Goal: Help people earn steady incomes that allow them to meet their health needs.

In the United States, 1 in 10 people live in poverty,[1] and many people can't afford things like healthy foods, health care, and housing. Healthy People 2030 focuses on helping more people achieve economic stability.

People with steady employment are less likely to live in poverty and more likely to be healthy, but many people have trouble finding and keeping a job. People with disabilities, injuries, or conditions like arthritis may be especially limited in their ability to work. In addition, many people with steady work still don't earn enough to afford the things they need to stay healthy.

Employment programs, career counseling, and high-quality child care opportunities can help more people find and keep jobs. In addition,

policies to help people pay for food, housing, health care, and education can reduce poverty and improve health and well-being.

Education Access and Quality

Goal: Increase educational opportunities and help children and adolescents do well in school.

People with higher levels of education are more likely to be healthier and live longer. Healthy People 2030 focuses on providing high-quality educational opportunities for children and adolescents — and on helping them do well in school.

Children from low-income families, children with disabilities, and children who routinely experience forms of social discrimination — like bullying — are more likely to struggle with math and reading. They're also less likely to graduate from high school or go to college. This means they're less likely to get safe, high-paying jobs and more likely to have health problems like heart disease, diabetes, and depression.

In addition, some children live in places with poorly performing schools, and many families can't afford to send their children to college. The stress of living in poverty can also affect children's brain development, making it harder for them to do well in school. Interventions to help children and adolescents do well in school and help families pay for college can have long-term health benefits.

Health Care Access and Quality

Goal: Increase access to comprehensive, high-quality health care services.

Many people in the United States don't get the health care services they need. Healthy People 2030 focuses on improving health by helping people get timely, high-quality health care services.

About 1 in 10 people in the United States don't have health insurance.[1] People without insurance are less likely to have a primary care provider, and they may not be able to afford the health care services and medications they need. Strategies to increase insurance coverage rates are critical for making sure more people get important health care services, like preventive care and treatment for chronic illnesses.

Sometimes people don't get recommended health care services, like cancer screenings, because they don't have a primary care provider. Other times, it's because they live too far away from health care providers who offer them. Interventions to increase access to health care professionals and improve communication — in person or remotely — can help more people get the care they need.

Neighborhood and Built Environment

Goal: Create neighborhoods and environments that promote health and safety.

The neighborhoods people live in have a major impact on their health and well-being.[1]Healthy People 2030 focuses on improving health and safety in the places where people live, work, learn, and play.

Many people in the United States live in neighborhoods with high rates of violence, unsafe air or water, and other health and safety risks. Racial/ethnic minorities and people with low incomes are more likely to live in places with these risks. In addition, some people are exposed to things at work that can harm their health, like secondhand smoke or loud noises.

Interventions and policy changes at the local, state, and federal level can help reduce these health and safety risks and promote health. For example, providing opportunities for people to walk and bike in their communities — like by adding sidewalks and bike lanes — can increase safety and help improve health and quality of life.

Social and Community Context

Goal: Increase social and community support.

People's relationships and interactions with family, friends, co-workers, and community members can have a major impact on their health and well-being. Healthy People 2030 focuses on helping people get the social support they need in the places where they live, work, learn, and play.

Many people face challenges and dangers they can't control — like unsafe neighborhoods, discrimination, or trouble affording the things they need. This can have a negative impact on health and safety throughout life.

Positive relationships at home, at work, and in the community can help reduce these negative impacts. But some people — like children whose parents are in jail and adolescents who are bullied — often don't get support from loved ones or others. Interventions to help people get the social and community support they need are critical for improving health and well-being.

Next>Personal Behavior and Community Health

How do personal responsibility and the health of our community interrelate?

Class 1-4: Barriers to Wellness

Personal Choices and Community Health

Earlier in the course, we discussed personal wellness behaviors from the perspective of individual needs. Today, you've explored how the built environment and one's greater community can affect the opportunities for these behaviors. The following figure visually represents the idea that addressing these underlying causes of illness and other issues in the built environment can make it easier and more sustainable for individuals to make positive choices for themselves:

The following image has been excerpted from the British Columbia Provincial Health Services Authority's "Foundations for a Healthier Built Environment" Report under fair use:

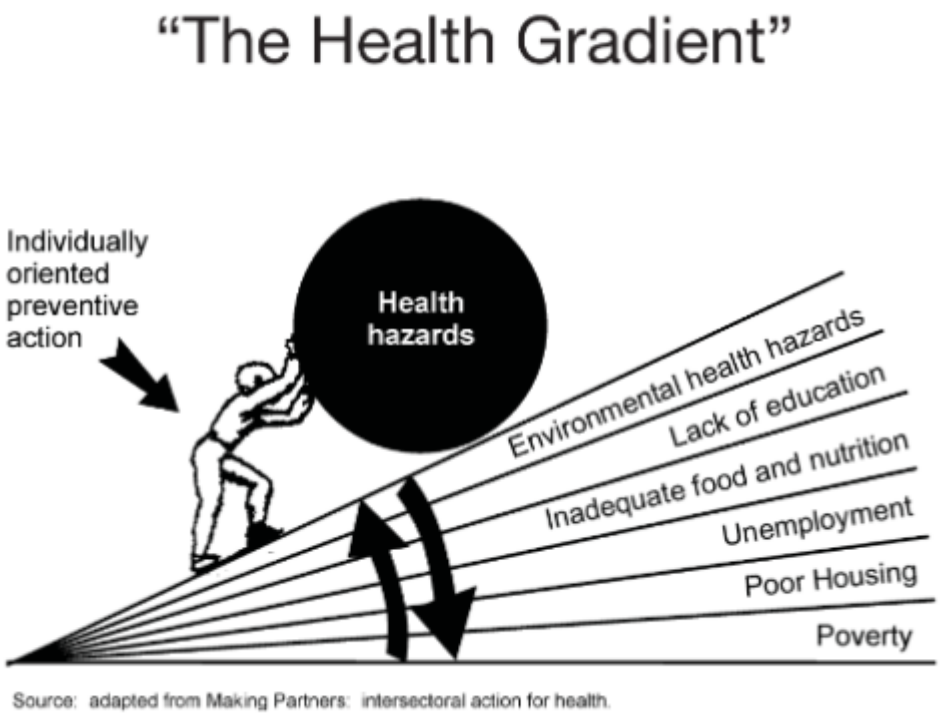


Figure 4: Social and Environmental Determinants of Health[21]

Food Deserts

Food deserts, areas where residents have limited access to healthy food options, demonstrate how extrapersonal (outside the individual) pressures can raise the "slope" of the challenges to regularly engaging in wellness behaviors.

We'll explore food deserts in more detail when we discuss nutrition later in the course.

For now, watch this brief (3.5 minute) video for an introduction to food deserts.

How are personal choices related to food affected by the built environment around us?

Community Initiatives

Though these issues can seem insurmountable, community efforts to lower the "slope" of the built environment's barriers can create can empower individuals to improve their health and well-being. Public health researchers, community investment professionals, and other stakeholders work to address these barriers.

Watch this video from NPR to learn about some initiatives and how they are helping to offer citizens the choices and opportunities needed to lead healthier lives.

Next>Health Literacy

Communities that are developed in a way that supports wellness behaviors encourage individuals to make decisions.

Still, many face barriers in accessing information and resources for their health, as well as interacting with doctors, pharmacists, and other health professionals.

Read on to learn about health literacy.

Class 1-4: Barriers to Wellness

Health Literacy

The following has been excerpted and adapted from The United States Centers for Disease Control and Preventions' Health Literacy page under fair use:

Health Literacy

The CDC currently identifies two facets to health literacy:

- **Personal health literacy** is the degree to which individuals have the ability to find, understand, and use information and services to inform health-related decisions and actions for themselves and others.
- **Organizational health literacy** is the degree to which organizations equitably enable individuals to find, understand, and use information and services to inform health-related decisions and actions for themselves and others.

Health literacy is important for everyone because, at some point in our lives, we all need to be able to find, understand, and use health information and services.

This brief (2-minute) video, offered by Blue Cross Blue Shield of Michigan, will give you an overview of this topic.

Next>Mental Health Conditions

Class 1-4: Barriers to Wellness

Mental Health

The following has been excerpted and adapted from the National Alliance on Mental Illness under fair use:

Mental Health Conditions

NAMI recognizes that other organizations have drawn distinctions between what diagnoses are considered "mental health conditions" as opposed to "mental illnesses." We intentionally use the terms "mental health conditions" and "mental illness/es" interchangeably.

A mental illness is a condition that affects a person's thinking, feeling, behavior or mood. These conditions deeply impact day-to-day living and may also affect the ability to relate to others. If you have — or think you might have — a mental illness, the first thing you must know is that **you are not alone**. Mental health conditions are far more common than you think, mainly because people don't like to, or are scared to, talk about them. However:

- 1 in 5 U.S. adults experience mental illness each year
- 1 in 20 U.S. adults experience serious mental illness each year
- 1 in 6 U.S. youth aged 6-17 experience a mental health disorder each year
- 50% of all lifetime mental illness begins by age 14, and 75% by age 24

A mental health condition isn't the result of one event. Research suggests multiple, linking causes:

- Genetics, environment and lifestyle influence whether someone develops a mental health condition.
- A stressful job or home life makes some people more susceptible, as do traumatic life events.
- Biochemical processes and circuits and basic brain structure may play a role, too.

None of this means that you're broken or that you, or your family, did something "wrong."

Mental illness is no one's fault.

And for many people, recovery — including meaningful roles in social life, school and work — is possible, especially when you start treatment early and play a strong role in your own recovery process.

The following has been excerpted and adapted from the Mayo Clinic under fair use:

What's considered normal mental health?

By Mayo Clinic Staff

What's the difference between normal mental health and mental disorders? Sometimes the answer is clear, but often the distinction isn't so obvious. For example, if you're afraid of giving a speech in public, does it mean you have a mental health disorder or a run-of-the-mill case of nerves? Or, when does shyness become a case of social phobia?

Here's help understanding how mental health conditions are identified.

Mental health is the overall wellness of how you think, regulate your feelings and behave. Sometimes people experience a significant disturbance in this mental functioning. A mental disorder may be present when patterns or changes in thinking, feeling or behaving cause distress or disrupt a person's ability to function.

A mental health disorder may affect how well you:

- Maintain personal or family relationships
- Function in social settings
- Perform at work or school
- Learn at a level expected for your age and intelligence
- Participate in other important activities

Cultural norms and social expectations also play a role in defining mental health disorders. There is no standard measure across cultures to determine whether a behavior is normal or when it becomes disruptive. What might be normal in one society may be a cause for concern in another.

A diagnosis of a mental health condition may be made by a psychiatrist, psychologist, clinical social worker or other mental health professional. Your primary care doctor may also be involved in a diagnostic assessment or make referrals to a mental health specialist.

Each mental health condition has its own signs and symptoms. In general, however, professional help might be needed if you experience:

- Marked changes in personality, eating or sleeping patterns
- An inability to cope with problems or daily activities
- Feeling of disconnection or withdrawal from normal activities
- Unusual or "magical" thinking
- Excessive anxiety
- Prolonged sadness, depression or apathy
- Thoughts or statements about suicide or harming others
- Substance misuse
- Extreme mood swings
- Excessive anger, hostility or violent behavior

Many people who have mental health disorders consider their signs and symptoms a normal part of life or avoid treatment out of shame or fear.

If you're concerned about your mental health, don't hesitate to seek advice.

Consult your primary care doctor or make an appointment with a psychiatrist, psychologist or other mental health professional. It may be important for you to find a professional who is familiar with your culture or who demonstrates an understanding of the cultural and social context that's relevant to your experiences and life story.

With appropriate support, you can identify mental health conditions and receive appropriate treatment, such as medications or counseling.

The following has been excerpted and adapted from MentalHealth.Gov's website under fair use:

Get Immediate Help

People often don’t get the mental health services they need because they don’t know where to start.

Emergency Medical Services—911

If the situation is potentially life-threatening, get immediate emergency assistance by calling 911, available 24 hours a day.

Talk to your primary care doctor or another health professional about mental health problems. Ask them to connect you with the right mental health services.

National Suicide Prevention Lifeline, 1-800-273-TALK (8255) or Live Online Chat

If you or someone you know is suicidal or in emotional distress, contact the National Suicide Prevention Lifeline. Trained crisis workers are available to talk 24 hours a day, 7 days a week. Your confidential and toll-free call goes to the nearest crisis center in the Lifeline national network. These centers provide crisis counseling and mental health referrals.

SAMHSA Treatment Referral Helpline, 1-877-SAMHSA7 (1-877-726-4727)

Get general information on mental health and locate treatment services in your area. Speak to a live person, Monday through Friday from 8 a.m. to 8 p.m. EST.

Next>Summary

Continue to the final page for this class to review what you've learned and identify the tasks you will use to complete the class.

Class 1-4: Barriers to Wellness

Summary

Major Points

During today's class, you have learned about:

- The Built Environment
    - The physical surroundings humans have created, such as streets, buildings, parks, etc.
    - Researchers have found that the design of the built environment can encourage or discourage physical activity and other wellness behaviors.
- Social Determinants of Health
    - External conditions that influence the health of individuals.
    - Five categories and goals identified by The United States Department of Health and Human Services' Healthy People 2030 initiative:
        - Economic Stability - Goal: Help people earn steady incomes that allow them to meet their health needs.
        - Education Access and Quality - Goal: Increase educational opportunities and help children and adolescents do well in school.
        - Health Care Access and Quality - Goal: Increase access to comprehensive, high-quality health care services.
        - Neighborhood and Built Environment - Goal: Create neighborhoods and environments that promote health and safety.
        - Social and Community Context - Goal: Increase social and community support.
- The Health Gradient
    - Imagine "health" as a hill that each person is climbing.
    - The barriers, hazards, and difficulties that limit health and wellness raise the angle or "slope" of the hill.
    - Decreasing social and environmental barriers makes the hill easier to climb and empowers individuals to maintain health and work toward wellness.
    -

        - Food Deserts
            - Food deserts are one example of the barriers above.
            - Many areas in the United States have limited access to nutritious foods.
            - We will explore this complex issue further in the final portion of the course.
        - Community initiatives bring in health professionals, business interests, and community interests to lower barriers, increase opportunity, and support economic activity.
- Health Literacy
    - The degree to which information and services related to health are accessible and comprehensible to individuals.
    - Self-advocacy in healthcare means being knowledgeable and invested in your health, asking questions and collaborating with your medical professionals, and ensuring clarity in communication about your health.
- Mental Health Conditions
    - It is normal and healthy to experience anxiety, depression, boredom, unpleasant emotions, and intrusive thoughts.
        - Mental health professionals can assist with learning skills and tools to manage these normal experiences.
    - Mental health conditions are very common and can generally be improved with treatment.
    - It can be difficult to tell "normal" mental health challenges from ones that may require more assistance.
        - A mental health professional can help you navigate and understand your mental health.
            - Some signs that professional help may be indicated include:
                - Marked changes in personality, eating or sleeping patterns
                - Feeling of disconnection or withdrawal from normal activities
                - Prolonged sadness, depression or apathy
                - Excessive anger, hostility or violent behavior
        - 24/7 helplines include the SAMHSA Treatment Referral Helpline, 1-877-SAMHSA7 (1-877-726-4727) and the National Suicide Prevention Lifeline, 1-800-273-TALK (8255) or Live Online Chat

Class 1-5: Media and Well-Being

Overview

Today's Class Overview

In today's class, you will explore how our relationship with the media we experience informs, affects, and challenges our health and wellness.

Today's Class Objectives

By the end of today's class, you should be able to:

1. Define the Built Environment of Attention.
2. Explain the Casino Effect and how it encourages aimless media consumption.
3. Summarize the recent history of advertising and explain how attention is commodified (made into a currency).
4. Apply a knowledge of the extent to which images are manipulated in the media.
5. Recognize common forms of psuedoinformation.
6. Demonstrate the ability to critically evaluate content online and in the media.
7. Strategize about your personal relationship to forms of media.

Outline of Today's Class

- Materials
    1. Overview
    2. Review Last Class
    3. The Built Environment of Attention
    4. Altered Images and Unrealistic Expectations
    5. Echo Chambers
    6. Psuedoinformation
    7. Tools for Media Literacy
    8. Summary

Next>Review Last Class

Class 1-5: Media and Well-Being

Review

Reviewing 1-4: Barriers to Wellness

Last class, you learned about:

- The Built Environment
  - The physical surroundings humans have created, such as streets, buildings, parks, etc.
  - Researchers have found that the design of the built environment can encourage or discourage physical activity and other wellness behaviors.
- Social Determinants of Health
  - External conditions that influence the health of individuals.
  - Five categories and goals identified by The United States Department of Health and Human Services' Healthy People 2030 initiative:
    - Economic Stability - Goal: Help people earn steady incomes that allow them to meet their health needs.
    - Education Access and Quality - Goal: Increase educational opportunities and help children and adolescents do well in school.
    - Health Care Access and Quality - Goal: Increase access to comprehensive, high-quality health care services.
    - Neighborhood and Built Environment - Goal: Create neighborhoods and environments that promote health and safety.
    - Social and Community Context - Goal: Increase social and community support.
- The Health Gradient
  - Imagine "health" as a hill that each person is climbing.
  - The barriers, hazards, and difficulties that limit health and wellness raise the angle or "slope" of the hill.
  - Decreasing social and environmental barriers makes the hill easier to climb and empowers individuals to maintain health and work toward wellness.

    -
    - Food Deserts
        - Food deserts are one example of the barriers above.
        - Many areas in the United States have limited access to nutritious foods.
        - We will explore this complex issue further in the final portion of the course.
    - Community initiatives bring in health professionals, business interests, and community interests to lower barriers, increase opportunity, and support economic activity.
- Health Literacy
    - The degree to which information and services related to health are accessible and comprehensible to individuals.
    - Self-advocacy in healthcare means being knowledgeable and invested in your health, asking questions and collaborating with your medical professionals, and ensuring clarity in communication about your health.
- Mental Health
    - It is normal and healthy to experience anxiety, depression, boredom, unpleasant emotions, and intrusive thoughts.
        - Mental health professionals can assist with learning skills and tools to manage these normal experiences.
    - It can be difficult to tell "normal" mental health challenges from ones that may require more assistance.
        - A mental health professional can help you navigate and understand your mental health.
            - Some signs that professional help may be indicated include:
                - Marked changes in personality, eating or sleeping patterns
                - Feeling of disconnection or withdrawal from normal activities
                - Prolonged sadness, depression or apathy
                - Excessive anger, hostility or violent behavior
        - 24/7 helplines include the SAMHSA Treatment Referral Helpline, 1-877-SAMHSA7 (1-877-726-4727) and the National Suicide Prevention Lifeline, 1-800-273-TALK (8255) or Live Online Chat

Next>The Casino Effect

Class 1-5: Media and Well-Being

The Built Environment of Attention

The Casino Effect

Have you ever sat down to study for an exam, only to realize hours have passed and you've been scrolling through social media for most of them?

This experience of losing oneself in a series of swipes or clicks is commonly called the Casino Effect, after the way casinos are designed to encourage gamblers to keep playing for as long as possible.

> As explained in this article from The Guardian back in 2018:
>
> "Facebook, Twitter and other companies use methods similar to the gambling industry to keep users on their sites," said Natasha Schüll, the author of Addiction by Design, which reported how slot machines and other systems are designed to lock users into a cycle of addiction. "In the online economy, revenue is a function of continuous consumer attention – which is measured in clicks and time spent."
>
> Whether it's Snapchat streaks, Facebook photo-scrolling, or playing CandyCrush, Schüll explained, you get drawn into "ludic loops" or repeated cycles of uncertainty, anticipation and feedback — and the rewards are just enough to keep you going.
>
> "If you disengage, you get peppered with little messages or bonus offers to get your attention and pull you back in," said Schüll. "We have to start recognising the costs of time spent on social media. It's not just a game – it affects us financially, physically and emotionally."

When we open a social media app or website, we are spending a currency – attention – to be given some type of information or experience.

This might be access to our friends through messaging, updates on their lives through posts, or memes and other shared media.

We previously explored how sidewalks increase opportunities for safe physical activity, while streets designed without sidewalks discourage walking.

Last week, you learned about the "built environment" as the structures that create or limit opportunities for many wellness-related behaviors.

Similarly, the design of websites and apps encourage different behaviors.

Your Attention is a Commodity

Watch this brief interview with Dr. Tim Wu, author of *The Attention Merchants*, to learn about the "built environment of attention" and the companies that want to collect and sell your time and awareness.

Next>Altered Images

Class 1-5: Media and Well-Being

Altered Images and Unrealistic Expectations

Altered Images

One of the ways the built environment of attention affects us is by shifting our expectations in subtle ways.

While you may know logically that the images you see - such as actors in films and models on product labels - have been enhanced and polished, these images may still affect our expectations of normality subconsciously.

Recall the broad spectrum of cognitive biases and effects that our minds use to try to solve the three conundrums that Buster Benson identified. Specifically, consider the Familiarity Bias (where we like things because we see them frequently) and other cognitive distortions that demonstrate how our perception is influenced by what we see.

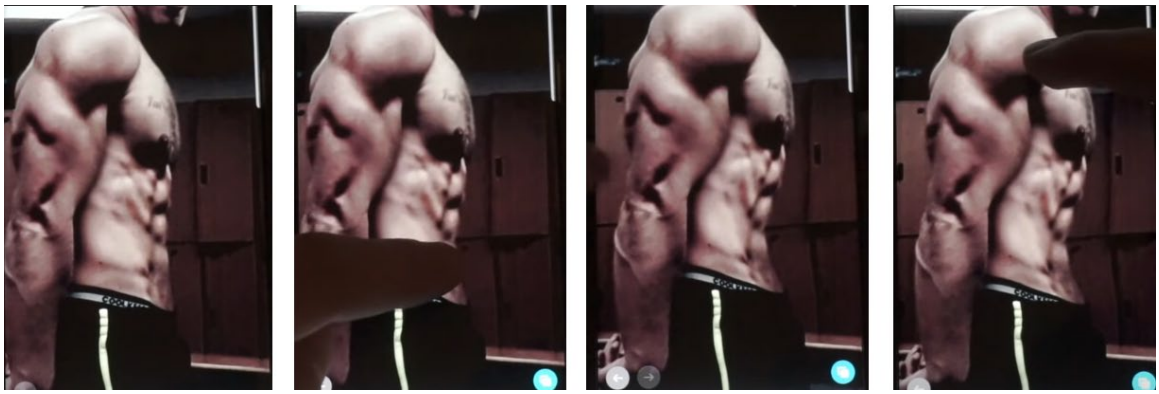
Before and After - Lighting and Photoshop

This brief video will demonstrate how professional photos in media are produced.

Physique Manipulation

Beyond the effects that lighting and retouching can have, smartphone apps allow anyone - including influencers - to subtly alter their bodies.

The image series below was excerpted from Youtube personality Kenny K.O.'s video "How "Instagram Models" Photoshop Pictures" under fair use.



Here is the before and after:

Would you have noticed the manipulation in the second photo if you hadn't seen how it was done?

The creator of the video points out the "warping" of the lockers behind him as a sign of the manipulation.

How would the manipulation be harder to spot if the person were standing in front of a solid color background?

Celebrities and Unrealistic Expectations

As you have seen, images can be heavily altered. Often, the alteration is so subtle that we may miss it.

While we might recognize the most extensively edited images, it can be hard to recognize when minor things - like skin clarity or apparent muscle size - have been edited in photos or video.

As a result, our conception of what is "realistic" can be influenced by what we see.

This is even more true of celebrities, actors, and professional athletes, who are able to complete "extreme body transformations" due to the teams of professionals, as well as time and money, available to them.

These "extreme body transformations" are generally unrealistic for most people due to the time and resources that are needed. As well, the 'screen-ready' looks are generally temporary and can have damaging effects on health. Later in the course we will explore what realistic fitness goals look like and how to go about making lasting changes to health and fitness behavior.

Comedian and writer Rob Mcelhenney gained and lost 60 pounds for a television show as a commentary on body image and media.

On Twitter, he sarcastically summarized the experience of achieving a "Hollywood" physique, pointing out that the celebrities we see throughout media have teams of personal trainers, nutritionists, chefs, assistants, and other resources that allow them to push their bodies beyond what is normally achievable, and not sustainable long-term.

- Look, it’s not that hard. All you need to do is lift weights six days a week,

> stop drinking alcohol, don't eat anything after 7pm, don't eat any carbs or sugar at all, in fact just don't eat anything you like, get the personal trainer from Magic Mike, sleep nine hours a night, run three miles a day, and have a studio pay for the whole thing over a six to seven month span. I don't know why everyone's not doing this. It's a super realistic lifestyle and an appropriate body image to compare oneself to. #hollywood

What do you think Rob McElhenney is saying with this tweet?

Next>Echo Chambers

Class 1-5: Media and Well-Being

Echo Chambers

Echo Chambers

You may have heard this term "echo chambers" before, but what are they and how do they harm our ability to be well?

Watch this brief (2 minute) video from the Goodwill Institute on echo chambers to find out.

Next>Psuedoinformation

Class 1-5: Media and Well-Being

Psuedoinformation

Knowing What Information to Trust

It can be hard to know what information is reliable on the internet, especially with regard to health.

Often, individuals share information that is incorrect (remember how cognitive distortions can convince us our existing beliefs are correct despite better evidence) or is intentionally misleading, whether for financial, personal, or political gain.

Read through the following sections to learn how to differentiate between valid information and three types of psuedoinformation.

THE FOLLOWING HAS BEEN EXCERPTED AND ADAPTED FROM THE JOHNS HOPKINS SHERIDAN LIBRARIES' "EVALUATING INFORMATION" PAGE UNDER FAIR USE:

Information vs. Psuedoinformation

Information is probably what you're looking for when you use the Internet for academic purposes. Information, at its most basic, is data set in a context for relevance. In other words, information tells us something that is understandable and has the potential to become knowledge for us when we view it critically and add it to what we already know.

For example, "8,000,000" and "9%" are not information; they are bits of data. However, "The population of New York City in 2000 was reported to top 8,000,000 persons, a growth of 9% since 1990" is indeed information. Adding that information to other information and data on the funding and expansion of public healthcare services in New York City would help city officials to develop knowledge of the stresses related to delivering healthcare services.

INFORMATION (noun): "Knowledge communicated concerning some particular fact, subject, or event; that of which one is apprised or told;

intelligence, news. spec. contrasted with data." (Oxford English Dictionary, 2nd ed., 1989)

Information should always be accurate, and either free of bias or making note of its own bias. To have value, information also needs to be useful for a given purpose.

Psuedoinformation Type 1: Propaganda

Propaganda is a commonly misused term. Because of its historical use, such as in the name of the infamous "National Ministry for Public Enlightenment and Propaganda" run by Joseph Goebbels for the Nazi government of Germany, many people associate propaganda with inflammatory speech or writing that has no basis is fact. In reality, propaganda may easily be based in fact, but facts represented in such a way as to provoke a desired response.

"Propaganda" is defined as the "systematic propagation of information or ideas by an interested party, esp. in a tendentious [promoting a particular point of view] way in order to encourage or instil a particular attitude or response. Also, the ideas, doctrines, etc., disseminated thus; the vehicle of such propagation."

(Oxford English Dictionary, 2nd ed., 1989)

Political campaign speeches and party political statements are often, in reality, a form of propaganda. They fit this definition when they present the opposing point of view in an unfavorable light. All political organizations do this on a variety of issues.

When you read documents or listen to audio or video files that characterize opinions or positions in terms of their integrity or moral content, you may well be in the presence of propaganda. Remember, the purpose of propaganda is to instill a particular attitude: to encourage you to think a particular way. Think for yourself: base your opinion on the facts, not the hype.

Psuedoinformation Type 2: Misinformation

"Misinformation" is defined as the action of misinforming or the condition of being misinformed; or erroneous or incorrect information. Misinformation differs from propaganda in that it always refers to

something which is not true. It differs from disinformation in that it is "intention neutral"; that is, misinformation is not deliberate, just wrong or mistaken.

One of the most popular forms of misinformation on the Internet is the passing along of "urban legends." Urban legends are fabricated or untrue stories that are passed along by sincere people who believe them, and then "inform" others.

Misinformation is perhaps the most difficult information lookalike to diagnose. Why? What strategies could you develop to determine whether what you are reading constitutes information or misinformation?

Urban legends sometimes begin in malice, but then become misinformation when they are repeated by sincerely misguided people. Everybody makes mistakes...check the validity of everything you read before you put your belief in it and use it.

Psuedoinformation Type 3: Disinformation

"Disinformation" refers to disseminating deliberately false information, especially when supplied by a government or its agent to a foreign power or on the media with the intention of influencing policies of those who receive it.

One of the most notorious uses of disinformation was the dissemination of anti-Semitic speeches and writing by the Nazi party in Germany during the 1930s and 1940s. Unfortunately, disinformation didn't end with World War II. In fact, the Internet is an excellent vehicle for disinformation.

One good starting point in determining whether or not a document may constitute disinformation is to find out who owns the document or domain and then find out what that individual or group's mission or beliefs are.

- Ask yourself what the document owner has to gain by circulating the document
- Always validate or confirm information on individuals, institutions or groups, and countries that you find on the Internet
- If you don't know who wrote what you read or why they wrote it, you don't know if it's trustworthy

Next>Tools for Media Literacy

Class 1-5: Media and Well-Being

Tools for Media Literacy

Telling Information from Psuedoinformation

Even with the definitions from the previous page, it can be very difficult to tell recognize psuedoinformation.

In fact, psuedoinformation seems to spread more quickly than reliable information, as the Associated Press reported in 2020:

> Scientists at the Massachusetts Institute of Technology analyzed more than 126,000 stories, some true and some false, that were tweeted millions of times from 2006 through the end of 2016. They found that misleading or incorrect stories traveled six times faster — and reached more people.
>
> Online misinformation has been blamed for deepening America's political polarization and contributing to distrust in government. The risks were highlighted in 2016 when Russian trolls created fake accounts to spread and amplify social media posts about controversial issues.

Often, psuedoinformation is disguised by rhetorical devices (communication techniques) that can make it hard to identify or clarify, such as trolling and sealioning.

As well, psuedoinformation often plays on the internal cognitive biases explored earlier in the course, simultaneously using emotionally manipulative or sensationalist language and imagery to encourage strong reactions to the content.

This brief video (3 minutes) from Factcheck.org explains how to recognize when false or misleading information is being presented as news:

→ How to Spot Fake News - FactCheck.org

Below, you'll find some additional resources that can help you evaluate information online and better understand media literacy.

Six questions that will tell you what media to trust

The following has been excerpted and adapted from The American Press Institute under fair use:

The American Press Institute presents six easy questions that you can use to evaluate media you see.

1. Type: What kind of content is this?

Recognize first what kind of content you're looking at.

Is it a news story? Or is it an opinion piece? Is it an ad or what some people call native advertising produced by a company? Is it a reaction to someone else's content?

2. Source: Who and what are the sources cited and why should I believe them?

News content usually cites sources for the information provided. These are the people quoted, or the documents or reports or data being referred to.

As you read, listen or watch a piece of content, note who is being cited. If it's text, print it out and circle the sources. Is it a police official? A politician? What party? If it's research, what organization produced it and what background if any is offered about them?

3. Evidence: What's the evidence and how was it vetted?

Evidence is closely related to but slightly different than source.

Evidence is the proof that the sources offer for what they know. It overlaps with how close someone is to an event. But even highly credentialed sources may begin to speculate sometimes. They may be guessing.

So, first, identify the evidence that any source is offering. Circle it. Write it down. Do it as an exercise a couple times. It becomes easy to recognize.

Is the evidence a document? Was it something the source saw as an eyewitness? Is it hearsay, or second-hand? Or are they speculating about someone's motives or what they might have done?

Next, what if anything did the author do to verify this evidence? Did they check with a lot of sources? Do these sources disagree? Can you see how they vetted the evidence?

4. Interpretation: Is the main point of the piece proven by the evidence?

Most media content offers a thesis, or main point, of some kind.

The one exception might be a straightforward account of a breaking news event. Most other stories, however, are built around an idea, a trend, or even some angle on a news event. Even content that isn't narrative usually has a thesis or a point. For instance, most charts point you to a conclusion — like the number of people with jobs in America is going down or baseball salaries are going up.

So the fourth step in knowing whether something is reliable is to ask whether this main point makes sense, and whether the conclusions are supported by the evidence offered.

In other words, think about what conclusions are being drawn. Do they follow logically from what has been cited? Sometimes this is a matter of some conclusions making sense but others going too far. Are too many conclusions being drawn from evidence that doesn't support all of them?

5. Completeness: What's missing?

Most content should lead to more questions. An important step in being a critical, questioning consumer is to ask yourself what you don't understand about a subject. Look back at the piece. Did you miss something? Or was it not there?

If there was important information missing from the story, that is a problem. If something was explained so poorly that it wasn't clear, that's also a problem.

If something was missing and the story explained why—this couldn't be answered yet—that is a good thing.

The point of any news content is not just to tell you something. It should be to create understanding and also to help you to react or take action. So sometimes what might be missing from a story or segment or piece of content is what you can do about it.

6. Knowledge: Am I learning every day what I need?

This last, sixth question is less about checking one story than checking yourself to see if you are spending your media time well. It's almost like calorie counting.

Think about what media you consumed yesterday. What did you learn about? What did you read about? It can be hard to remember. But try. Jot down what you consumed for a couple days. You might be surprised. It

also might not have been done in a conventional way. Maybe it came through social media. Or conversation. It's still consuming news.

Here are some questions you can ask yourself to see if you are learning what you think you should

- What are some things you hear people talking about that you wished you understood better? Where could you go to learn?
- Could I explain this situation to someone?
- Look at top stories on a website or a newspaper front page? How many of them are you familiar with? Do you think you should understand them?

This process of critical thinking about media is something we all do. When you decide what to click on, what to read, and when you lose interest and stop reading, you are making critical decisions about what matters and what you trust or what you don't understand. These six questions are the same ones that editors and producers in the media world use to edit stories and make up web pages.

In the age when we are all both editors and consumers, we all need to know them.

Resources

No single resource should be considered infallible, but the websites below may be helpful in understanding issues related to online content and in evaluating media content you encounter.

- The National Association for Media Literacy Education works to further media literacy in the United States.
- The United Nations Educational, Scientific, and Cultural Organization offers an extensive resource on identifying false information online.
- Started in the 1990s as a resource for evaluating urban legends, Snopes.com attempts to investigate and clarify forms of psuedoinformation online.
- The Allsides.com website attempts to represent news events by exploring how different sources report the information.
- Ballotpedia.org attempts to encourage access and participation in the democratic process by providing concrete details (i.e., how the process works, the names of those running, etc.). while avoiding sensationalism. For example, the website provides ballots for upcoming elections and introductory candidate biographies using direct references to original sources for each statement about the candidate.

Next>Summary

Class 1-5: Media and Well-Being

Summary

Major Points

During today's class, you have learned:

- The Built Environment of Attention
    - The "built environment" that directs our attention in the same way that streets and buildings direct our physical movement.
- The Casino Effect
    - The tendency to "lose track" of one's time and attention online.
    - Dr. Wu suggests this is the result of design elements like infinite scroll and complex algorithms.
- Attention Merchants
    - Companies like social media platforms who collect and resell attention to advertisers.
- Altered Images and Unrealistic Expectations
    - Images in media often lack explicit indications that they have been edited, leading to a false idea of what looks "normal."
    - Actors, models, influencers, and athletes often have teams of professionals behind the scenes, without whom their physiques would not be achievable or sustainable.
- Echo Chambers
    - Social groups, websites, or other situations where conflicting information or perspectives are not considered.
- Psuedoinformation
    - Propaganda - Information (factual or not) intended to create a particular response or attitude or reinforce a specific point of view.
    - Misinformation - Incorrect information, not necessarily intentional (urban legends).
    - Disinformation - Intentionally false information distributed for an individual or a group's gain.
- Six Questions to Ask
    - Type: What kind of content is this?
    - Source: Who and what are the sources cited and why should I believe them?

- Evidence: What's the evidence and how was it vetted?
- Interpretation: Is the main point of the piece proven by the evidence?
- Completeness: What's missing?
- Knowledge: Am I learning every day what I need?

Class 2-1: Planning for Fitness

Overview

Today's Class Overview

In today's class, you will learn about the benefits and fundamental principles of behavior change and adaptation to exercise.

Today's Class Objectives

By the end of this module you should be able to:

1. Summarize the health benefits of physical activity and exercise.
2. Apply the Transtheoretical Model of Change
3. Apply the S.M.A.R.T. principle for setting realistic goals.
4. Apply the F.I.T.T. principle for planning a physical activity program.
5. Apply the Seven Principles of Adaptation to exercise.
6. Identify the benefits of a proper warm-up and cool-down.
7. Strategize about barriers to physical activity.

Outline of Today's Class

- Materials
    1. Overview
    2. Review
    3. Health Benefits of Physical Activity and Exercise
    4. Transtheoretical Model of Behavior Change
    5. S.M.A.R.T. Goal Setting
    6. Principles of Adaptation
    7. Safe and Active
    8. Warm-up and Cool-down
    9. Overcoming Barriers to Physical Activity
    10. Summary

Next>Review

Class 2-1: Planning for Fitness

Review

As you prepare to move into this second portion of the course, take a moment to recall these major concepts and keep them in mind as you continue in the course.

- Hierarchy of Needs
- Seven Dimensions of Wellness
- Metacognition
- Cognitive Biases
- Emotional Intelligence
- Stress Management
- Mindfulness
- Healthy Relationships
- Sleep
- The Physical Built Environment
- Social Determinants of Health
- The "Health Gradient"
- Health Literacy
- Mental Health
- The Built Environment of Attention
- Psuedoinformation
- Media Literacy

Next>Health Benefits of Physical Activity and Exercise

Class 2-1: Planning for Fitness

Health Benefits of Physical Activity and Exercise

The following has been excerpted and adapted from Introduction to Health, Authored by: Kelly Falcone, EdD, Provided by: Palomar College(CC-BY-SA) under fair use:

Health Benefits of Physical Activity

Regular physical activity is one of the most important things you can do for your health. In many studies covering a wide range of issues, researchers have focused on exercise, as well as on the more broadly defined concept of physical activity. Exercise is a form of physical activity that is planned, structured, repetitive, and performed with the goal of improving health or fitness. So, although all exercise is physical activity, not all physical activity is exercise. Being more physically active and also doing more exercise can help to:

- Control your weight
- Reduce your risk of cardiovascular disease
- Reduce your risk for type 2 diabetes and metabolic syndrome
- Reduce your risk of some cancers
- Strengthen your bones and muscles
- Improve your mental health and mood
- Improve your ability to do daily activities and prevent falls
- Increase your chances of living longer

Begin Taking Steps to be More Physically Active Everyday

If you're not sure about becoming active or boosting your level of physical activity because you're afraid of getting hurt, the good news is that moderate-intensity aerobic activity, like brisk walking, is generally safe for most people.

Start slowly. Cardiac events, such as a heart attack, are rare during physical activity. But the risk does go up when you suddenly become much

more active than usual. For example, you can put yourself at risk if you don't usually get much physical activity and then all of a sudden do vigorous-intensity aerobic activity, like shoveling snow. That's why it's important to start slowly and gradually increase your level of activity.

If you have a chronic health condition such as arthritis, diabetes, or heart disease, talk with your doctor to find out if your condition limits, in any way, your ability to be active. Then, work with your doctor to come up with a physical activity plan that matches your abilities. If your condition stops you from meeting the minimum Guidelines, try to do as much as you can. What's important is that you avoid being inactive. Even 60 minutes a week of moderate-intensity aerobic activity is good for you.

The bottom line is – the health benefits of physical activity far outweigh the risks of getting hurt. The following list explains how being more active can positively impact your health:

- Control Your Weight
    - Looking to get to or stay at a healthy weight? Both diet and physical activity play a critical role in controlling your weight. You gain weight when the calories you burn, including those burned during physical activity, are less than the calories you eat or drink. When it comes to weight management, people vary greatly in how much physical activity they need. You may need to be more active than others to achieve or maintain a healthy weight.
    - To maintain your weight: Work your way up to 150 minutes of moderate-intensity aerobic activity, 75 minutes of vigorous-intensity aerobic activity, or an equivalent mix of the two each week. Strong scientific evidence shows that physical activity can help you maintain your weight over time. However, the exact amount of physical activity needed to do this is not clear since it varies greatly from person to person. It's possible that you may need to do more than the equivalent of 150 minutes of moderate-intensity activity a week to maintain your weight.
    - To lose weight and keep it off: You will need a high amount of physical activity unless you also adjust your diet and reduce the amount of calories you're eating and drinking. Getting to and staying at a healthy weight requires both regular physical activity and a healthy eating plan. The CDC has some great tools and information about nutrition,

physical activity and weight loss. For more information, visit Healthy Weight.

- Reduce Your Risk of Cardiovascular Disease
    - Heart disease and stroke are two of the leading causes of death in the United States. But following the Guidelines and getting at least 150 minutes a week (2 hours and 30 minutes) of moderate-intensity aerobic activity can put you at a lower risk for these diseases. You can reduce your risk even further with more physical activity. Regular physical activity can also lower your blood pressure and improve your cholesterol levels.
- Reduce Your Risk of Type 2 Diabetes and Metabolic Syndrome
    - Regular physical activity can reduce your risk of developing type 2 diabetes and metabolic syndrome. Metabolic syndrome is a condition in which you have some combination of too much fat around the waist, high blood pressure, low HDL cholesterol, high triglycerides, or high blood sugar. Research shows that lower rates of these conditions are seen with 120 to 150 minutes (2 hours to 2 hours and 30 minutes) a week of at least moderate-intensity aerobic activity. And the more physical activity you do, the lower your risk will be.
    - Already have type 2 diabetes? Regular physical activity can help control your blood glucose levels. To find out more, visit Managing Diabetes.
- Reduce Your Risk of Some Cancers
- Strengthen Your Bones and Muscles
    - As you age, it's important to protect your bones, joints and muscles. Not only do they support your body and help you move, but keeping bones, joints and muscles healthy can help ensure that you're able to do your daily activities and be physically active. Research shows that doing aerobic, muscle-strengthening and bone-strengthening physical activity of at least a moderately-intense level can slow the loss of bone density that comes with age.
    - Hip fracture is a serious health condition that can have life-changing negative effects, especially if you're an older adult. But research shows that people who do 120 to 300 minutes of at least moderate-intensity aerobic activity each week have a lower risk of hip fracture.
    - Regular physical activity helps with arthritis and other

conditions affecting the joints. If you have arthritis, research shows that doing 130 to 150 (2 hours and 10 minutes to 2 hours and 30 minutes) a week of moderate-intensity, low-impact aerobic activity can not only improve your ability to manage pain and do everyday tasks, but it can also make your quality of life better.
    - Build strong, healthy muscles. Muscle-strengthening activities can help you increase or maintain your muscle mass and strength. Slowly increasing the amount of weight and number of repetitions you do will give you even more benefits, no matter your age.
- Improve Your Mental Health and Mood
    - Regular physical activity can help keep your thinking, learning, and judgment skills sharp as you age. It can also reduce your risk of depression and may help you sleep better. Research has shown that doing aerobic or a mix of aerobic and muscle-strengthening activities 3 to 5 times a week for 30 to 60 minutes can give you these mental health benefits. Some scientific evidence has also shown that even lower levels of physical activity can be beneficial.
- Improve Your Ability to do Daily Activities and Prevent Falls
    - A functional limitation is a loss of the ability to do everyday activities such as climbing stairs, grocery shopping, or playing with your grandchildren.
    - How does this relate to physical activity? If you're a physically active middle-aged or older adult, you have a lower risk of functional limitations than people who are inactive
    - Already have trouble doing some of your everyday activities? Aerobic and muscle-strengthening activities can help improve your ability to do these types of tasks.
- Increase Your Chances of Living Longer
    - Science shows that physical activity can reduce your risk of dying early from the leading causes of death, like heart disease and some cancers. This is remarkable in two ways:

Only a few lifestyle choices have as large an impact on your health as physical activity. People who are physically active for about 7 hours a week have a 40 percent lower risk of dying early than those who are active for less than 30 minutes a week.

You don’t have to do high amounts of activity or vigorous-intensity activity to reduce your risk of premature death. You can put yourself at lower risk of dying early by doing at least 150 minutes a week of moderate-intensity aerobic activity.

Everyone can gain the health benefits of physical activity – age, ethnicity, shape or size do not matter.

Next>Transtheoretical Model of Change

Class 2-1: Planning for Fitness

Transtheoretical Model of Behavior Change

The following has been excerpted and adapted from Concepts of Fitness and Wellness, 2nd Edition, Georgia Highlands College (CC BY 4.0) :

Behaviors That Promote Wellness

Bad habits are hard to break, but choosing to eat healthier and exercise more provides benefits that go far beyond a more ideal body weight and shape.

Being physically fit nurtures the mind, body, and spirit and is the cornerstone of wellness. The links below provide information about behaviors within your control that contribute to an improved quality of life and increased wellness.

Behavior Modification

Making permanent lifestyle changes is one of the greatest challenges a person can face.

This section will explore how changes to behavior occur, the psychological barriers that hamper efforts to change, and tips for making lasting change.

How Changes in Behavior Occur

The Transtheoretical Model, also called the Stages of Change Model, was developed by James Prochaska and Carlo DiClemente in the late 1970s. Considered the dominant model for describing how behavior changes occur, it evolved through studies examining the experiences of smokers who quit on their own and comparing them with the experiences of those requiring further treatment. The goal of those studies was to understand why some people were capable of quitting on their own. It was determined that people quit smoking if they were ready to do so. Thus, the

Transtheoretical Model (TTM) focuses on the decision-making of the individual and is a model of intentional change.

The TTM operates on the assumption that people do not change behaviors quickly and decisively. Rather, change in behavior, especially habitual behavior, occurs continuously through a cyclical process. The TTM is not a theory but a model; different behavioral theories and constructs can be applied to various stages of the model where they may be most effective.

The TTM posits that individuals move through six stages of change: precontemplation, contemplation, preparation, action, maintenance, and termination. Termination was not part of the original model and is less often used in application of stages of change for health-related behaviors. For each stage of change, different intervention strategies are most effective at moving the person to the next stage of change and subsequently through the model to maintenance, the ideal stage of behavior.

Six Stages of Change:

- Stage 1: Precontemplation
    - In this stage, people do not intend to take action in the foreseeable future (defined as within the next 6 months). People are often unaware that their behavior is problematic or produces negative consequences. People in this stage often underestimate the pros of changing behavior and place too much emphasis on the cons of changing behavior.
- Stage 2: Contemplation
    - In this stage, people are intending to start the healthy behavior in the foreseeable future (defined as within the next 6 months). People recognize that their behavior may be problematic, and a more thoughtful and practical consideration of the pros and cons of changing the behavior takes place, with equal emphasis placed on both. Even with this recognition, people may still feel ambivalent toward changing their behavior.
- Stage 3: Preparation (Determination)
    - In this stage, people are ready to take action within the next 30 days. People start to take small steps toward the behavior

change, and they believe changing their behavior can lead to a healthier life.

- Stage 4: Action
    - In this stage, people have recently changed their behavior (defined as within the last 6 months) and intend to keep moving forward with that behavior change. People may exhibit this by modifying their problem behavior or acquiring new healthy behaviors.
- Stage 5: Maintenance
    - In this stage, people have sustained their behavior change for a while (defined as more than 6 months) and intend to maintain the behavior change going forward. People in this stage work to prevent relapse to earlier stages.
- Stage 6: Termination
    - In this stage, people have no desire to return to their unhealthy behaviors and are sure they will not relapse. Since this is rarely reached, and people tend to stay in the maintenance stage, this stage is often not considered in health promotion programs.

Ten Processes of Change:

1. Consciousness Raising - Increasing awareness about the healthy behavior.
2. Dramatic Relief - Emotional arousal about the health behavior, whether positive or negative arousal.
3. Self-Reevaluation - Self-reappraisal to realize the healthy behavior is part of who they want to be.
4. Environmental Reevaluation - Social reappraisal to realize how their unhealthy behavior affects others.
5. Social Liberation - Environmental opportunities that exist to show society is supportive of the healthy behavior.
6. Self-Liberation - Commitment to change behavior based on the belief that achievement of the healthy behavior is possible.
7. Helping Relationships - Finding supportive relationships that encourage the desired change.
8. Counter-Conditioning - Substituting healthy behaviors and thoughts for unhealthy behaviors and thoughts.
9. Reinforcement Management - Rewarding the positive behavior and reducing the rewards that come from negative behavior.
10. Stimulus Control - Re-engineering the environment to have

reminders and cues that support and encourage the healthy behavior and remove those that encourage the unhealthy behavior.

Limitations of the Transtheoretical Model

Limitations of the model include the following:

The theory ignores the social context in which change occurs, such as socioeconomic status and income.

The lines between the stages can be arbitrary with no set criteria of how to determine a person's stage of change. The questionnaires that have been developed to assign a person to a stage of change are not always standardized or validated.

No clear sense exists for how much time is needed for each stage, or how long a person can remain in a stage.

The model assumes that individuals make coherent and logical plans in their decision-making process when this is not always true.

To progress through the stages of change, people apply cognitive, affective, and evaluative processes. Ten processes of change have been identified, with some processes being more relevant to a specific stage of change than other processes. These processes result in strategies that help people make and maintain change.

Next>Setting S.M.A.R.T. Goals

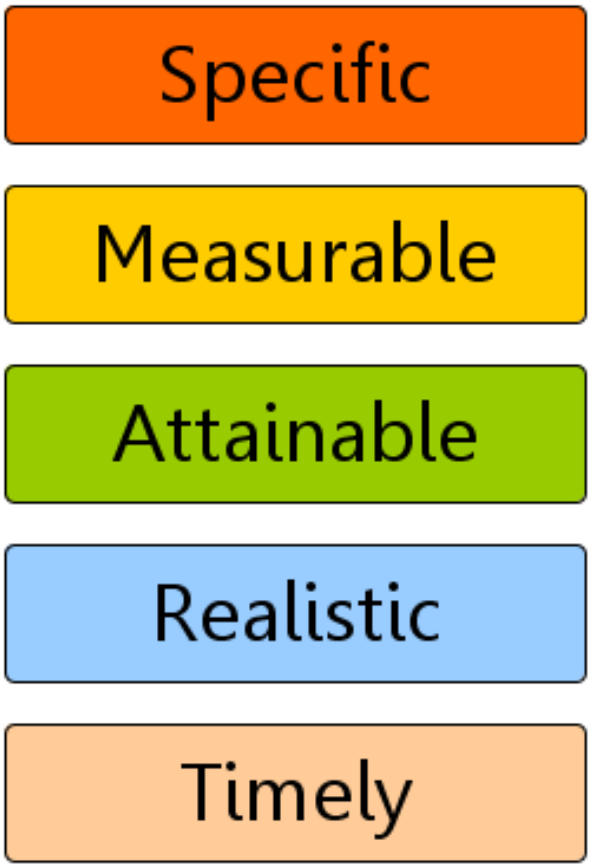
Class 2-1: Planning for Fitness

S.M.A.R.T. Goal Setting

The following has been excerpted and adapted from Introduction to Health, Authored by: Kelly Falcone, EdD, Provided by: Palomar College(CC-BY-SA):

SMART Goal Setting

Have you ever said to yourself that you need to "eat healthier" or "exercise more" to improve your overall health? How well did that work for you? In most cases, probably not very well. That's because these statements are too vague and do not give us any direction for what truly needs to be done to achieve such goals. To have a better chance at being successful, try using the SMART acronym for setting your goals (S= Specific, M= Measurable, A=Attainable, R= Realistic, T= Time-oriented):



Specific – Create a goal that has a focused and clear path for what you actually need to do. Examples:

- I will drink 8 ounces of water 3 times per day
- I will walk briskly for 30 minutes, 5 times per week
- I will reduce my soda intake to no more than 2 cans of soda per week

Do you see how that is more helpful than just saying you will eat healthier or exercise more? It gives you direction.

Measurable – This enables you to track your progress, and ties in with the "specific" component. The above examples all have actual numbers associated with the behavior change that let you know whether or not it has been met.

Attainable – Make sure that your goal is within your capabilities and not too far out of reach. For example, if you have not been physically active for a number of years, it would be highly unlikely that you would be able to achieve a goal of running a marathon within the next month.

Realistic – Try to ensure that your goal is something you will be able to continue doing and incorporate as part of your regular routine/lifestyle. For example, if you made a goal to kayak 2 times each week, but don't have the financial resources to purchase or rent the equipment, no way to transport it, or are not close enough to a body of water in which to partake in kayaking, then this is not going to be feasible.

Time-oriented – Give yourself a target date or deadline in which the goal needs to be met. This will keep you on track and motivated to reach the goal, while also evaluating your progress.

Next>Safe and Active

Class 2-1: Planning for Fitness

Principles of Adaptation

The following has been excerpted and adapted from Introduction to Health, Authored by: Kelly Falcone, EdD, Provided by: Palomar College(CC-BY-SA):

Principles of Adaptation

There are seven major principles that inform how we go about developing strength, endurance, cardiovascular (heart and lung) health, as well as flexibility, balance, speed, and other skill-based components of fitness.

1. Individuality - People will have unique responses to the same training stimulus, due to individual characteristics such as biological age, training age, gender, body size and shape, past injuries etc. Thus, training should be adjusted to the individual's characteristics and needs.
2. Specificity - Physiological adaptations to training are specific to the muscle groups trained, the intensity of the exercise, the metabolic demands of the exercise, and specific movements and activities.
3. Overload - Certain adaptations require training with greater stimulus than that which the body is accustomed to.This could be done by increasing the intensity, duration, or frequency of training.
4. Progression - Overloading should occur at an optimal level and time frame to maximise performane. Overloading too quickly may lead to poor technique or injury, while very slow overloading may result in little or no improvements.
5. Diminishing Returns - An individual's level of training determines how much improvements in performance they achieve due to training. A novice will see huge and relatively quick gains in performance when they begin training, however, the gains get smaller and come more slowly as they get more experienced.
6. Reversibility - The effects of training will be lost if training stimulus is removed for an extended period of time.
7. Rest and Recovery - Rest and recovery from the stress of exercise must take place in proportionate amounts to avoid too much stress and allow time to adapt.

F.I.T.T.

In exercise, the amount of stress placed on the body can be controlled by four variables: Frequency, Intensity, Time (duration), and Type, better known as FITT.

The FITT principle, as outlined by the American College of Sports Medicine (ACSM) falls under the larger principle of overload.

FREQUENCY

Frequency relates to how often exercises are performed over a period of time.

In most cases, the number of walking or jogging sessions would be determined over the course of a week.

A beginner may determine that 2–3 exercise sessions a week are sufficient enough to stimulate improvements.

On the other hand, a seasoned veteran may find that 2–3 days is not enough to adequately stress the system.

According to the overload principle, as fitness improves, so must the stress to ensure continued gains and to avoid plateauing.

INTENSITY

Intensity, the degree of difficulty at which the exercise is carried out, is the most important variable of FITT.

More than any of the other components, intensity drives adaptation.

Because of its importance, it is imperative for those beginning a fitness program to quantify intensity, as opposed to estimating it as hard, easy, or somewhere in between. Not only will this numeric value provide a better understanding of the effort level during the exercise session, but it will also help in designing sessions that accommodate individual goals.

How then can intensity be measured? Heart rate is one of the best ways to measure a person's effort level for cardiorespiratory fitness. Using a

percentage of maximum lifting capacity would be the measure used for resistance training.

TIME

The duration of exercise, or time, also contributes to the amount of stress experienced during a workout. Certainly, a 30-minute brisk walk is less stressful on the body than a 4-hour marathon.

TYPE OF EXERCISE

Simply put, the type of exercise performed should reflect a person's goals. In cardiorespiratory fitness, the objective of the exercise is to stimulate the cardiorespiratory system. Other activities that accomplish the same objective include swimming, biking, dancing, cross country skiing, aerobic classes, and much more. As such, these activities can be used to build lung capacity and improve cellular and heart function.

However, the more specific the exercise, the better. While vigorous ballroom dancing will certainly help develop the cardiorespiratory system, it will unlikely improve a person's 10k time. To improve performance in a 10k, athletes spend the majority of their time training by running, as they will have to do in the actual 10k. Cyclists training for the Tour de France, spend up to six hours a day in the saddle, peddling feverishly. These athletes know the importance of training the way they want their body to adapt. This concept, called the principle of specificity, should be taken into consideration when creating a training plan.

In this discussion of type and the principle of specificity, a few additional items should be considered. Stress, as it relates to exercise, is very specific. There are multiple types of stress. The three main stressors are metabolic stress, force stress, and environmental stress. Keep in mind, the body will adapt based on the type of stress being placed on it.

Metabolic stress results from exercise sessions when the energy systems of the body are taxed. For example, sprinting short distances requires near maximum intensity and requires energy (ATP) to be produced primarily through anaerobic pathways, that is, pathways not requiring oxygen to produce ATP. Anaerobic energy production can only be supported for a very limited time (10 seconds to 2 minutes). However, distance running at

steady paces requires aerobic energy production, which can last for hours. As a result, the training strategy for the distance runner must be different than the training plan of a sprinter, so the energy systems will adequately adapt.

Likewise, force stress accounts for the amount of force required during an activity. In weightlifting, significant force production is required to lift heavy loads. The type of muscles being developed, fast-twitch muscle fibers, must be recruited to support the activity. In walking and jogging, the forces being absorbed come from the body weight combined with forward momentum. Slow twitch fibers, which are unable to generate as much force as the fast twitch fibers, are the type of muscle fibers primarily recruited in this activity. Because the force requirements differ, the training strategies must also vary to develop the right kind of musculature.

Environmental stress, such as exercising in the heat, places a tremendous amount of stress on the thermoregulatory systems. As an adaptation to the heat, the amount of sweating increases as does plasma volume, making it much easier to keep the body at a normal temperature during exercise. The only way to adapt is through heat exposure, which can take days to weeks to properly adapt.

In summary, to improve performance, being specific in your training, or training the way you want to adapt, is paramount.

Developing a Personal Exercise Program

To help you follow the guidelines for physical activity use the FITT chart to design your weekly exercise routine. FITT stands for Frequency, Intensity, Time, and Type.

FITT Principle	CRE: cardiorespiratory endurance (Aerobic exercises)	MS/ME: Muscular strength /Endurance	FL: Flexibility
F (Frequency)	3-5 days/week	2-3 days/week	Most if not all days/week

I (Intensity)	Keep heart rate in the Target heart rate zone. 50-70% of HRmax for moderate intensity and 70-85% for vigorous intensity	Sufficient resistance to fatigue muscles. Ensure the last repetitions are difficult.	To the point of tension.
T (Time)	At least 10 minutes at a time and for a total of 2:30 hours/week of moderate activity or 1:15 minutes/week of vigorous activity.	For general fitness do 1-2 sets of 8-12 repetitions.	2-4 reps of each exercise held for 15-30 seconds
T (Type)	Continuous rhythmic activities that keep the heart rate elevated. Example: running, walking, swimming, cycling	Choose strength training exercises that target all major muscle groups.	Stretching exercises that target all major muscle groups.

Next>Safe and Active

Class 2-1: Planning for Fitness

Safe and Active

The following has been excerpted and adapted from Lifetime Fitness and Wellness (Lumen) under fair use via Libretexts:

> Although physical activity has many health benefits, injuries and other adverse events do sometimes happen. The most common injuries affect the musculoskeletal system (the bones, joints, muscles, ligaments, and tendons). Other adverse events can also occur during activity, such as overheating and dehydration. On rare occasions, people have heart attacks during activity. The good news is that scientific evidence strongly shows that physical activity is safe for almost everyone. Moreover, the health benefits of physical activity far outweigh the risks. Still, people may hesitate to become physically active because of concern they'll get hurt. For these people, there is even more good news: They can take steps that are proven to reduce their risk of injury and adverse events. The Guidelines in this chapter provide advice to help people do physical activity safely. Most advice applies to people of all ages. Specific guidance for particular age groups and people with certain conditions is also provided.

Explaining the Guidelines

Physical Activity Is Safe for Almost Everyone

Most people are not likely to be injured when doing moderate-intensity activities in amounts that meet the *Physical Activity Guidelines*. However, injuries and other adverse events do sometimes happen. The most common problems are musculoskeletal injuries. Even so, studies show that only one such injury occurs for every 1,000 hours of walking for exercise, and fewer than four injuries occur for every 1,000 hours of running.

Both physical fitness and total amount of physical activity affect risk of musculoskeletal injuries. People who are physically fit have a lower risk of injury than people who are not. People who do more activity generally have a higher risk of injury than people who do less activity. So what should people do if they want to be active and safe? The best strategies are to:

- Be regularly physically active to increase physical fitness; and
- Follow the other guidance in this chapter (especially increasing physical activity gradually over time) to minimize the injury risk from doing medium to high amounts of activity.

Following these strategies may reduce *overall* injury risk. Active people are more likely to have an activity-related injury than inactive people. But they appear less likely to have non-activity-related injuries, such as work-related injuries or injuries that occur around the home or from motor vehicle crashes.

Key Guidelines for Safe Physical Activity

To do physical activity safely and reduce risk of injuries and other adverse events, people should:

- Understand the risks and yet be confident that physical activity is safe for almost everyone.
- Choose to do types of physical activity that are appropriate for their current fitness level and health goals, because some activities are safer than others.
- Increase physical activity gradually over time whenever more activity is necessary to meet guidelines or health goals. Inactive people should "start low and go slow" by gradually increasing how often and how long activities are done.
- Protect themselves by using appropriate gear and sports equipment, looking for safe environments, following rules and policies, and making sensible choices about when, where, and how to be active.
- Be under the care of a health-care provider if they have chronic conditions or symptoms. People with chronic conditions and symptoms should consult their health-care provider about the types and amounts of activity appropriate for them.

Choose Appropriate Types and Amounts of Activity

People can reduce their risk of injury by choosing appropriate types of activity. The safest activities are moderate intensity and low impact, and don't involve purposeful collision or contact.

Walking for exercise, gardening or yard work, bicycling or exercise cycling, dancing, swimming, and golf are activities with the lowest injury rates. In the amounts commonly done by adults, walking (a moderate-intensity and low-impact activity) has a third or less of the injury risk of running (a vigorous-

intensity and higher impact activity). The risk of injury for a type of physical activity can also differ according to the purpose of the activity. For example, recreational bicycling or bicycling for transportation leads to fewer injuries than training for and competing in bicycle races.

People who have had a past injury are at risk of injuring that body part again. The risk of injury can be reduced by performing appropriate amounts of activity and setting appropriate personal goals. Performing a variety of different physical activities may also reduce the risk of overuse injury.

Increase Physical Activity Gradually Over Time

The risk of injury to bones, muscles, and joints is directly related to the gap between a person's usual level of activity and a new level of activity.

Scientific studies indicate that the risk of injury to bones, muscles, and joints is directly related to the gap between a person's usual level of activity and a new level of activity. The size of this gap is called the amount of overload. Creating a small overload and waiting for the body to adapt and recover reduces the risk of injury. When amounts of physical activity need to be increased to meet the Guidelines or personal goals, physical activity should be increased gradually over time, no matter what the person's current level of physical activity.

Scientists have not established a standard for how to gradually increase physical activity over time. The following recommendations give general guidance for inactive people and those with low levels of physical activity on how to increase physical activity:

- Use relative intensity (intensity of the activity relative to a person's fitness) to guide the level of effort for aerobic activity.
- Generally start with relatively moderate-intensity aerobic activity. Avoid relatively vigorous-intensity activity, such as shoveling snow or running. Adults with a low level of fitness may need to start with light activity, or a mix of light- to moderate-intensity activity.
- First, increase the number of minutes per session (duration), and the number of days per week (frequency) of moderate-intensity activity. Later, if desired, increase the intensity.
- Pay attention to the relative size of the increase in physical activity each week, as this is related to injury risk. For example, a 20-minute increase each week is safer for a person who does 200 minutes a week of walking (a 10 percent increase), than for a person who does 40

minutes a week (a 50 percent increase).

The available scientific evidence suggests that adding a small and comfortable amount of light- to moderate-intensity activity, such as 5 to15 minutes of walking per session, 2 to 3 times a week, to one's usual activities has a low risk of musculoskeletal injury and no known risk of severe cardiac events. Because this range is rather wide, people should consider three factors in individualizing their rate of increase: age, level of fitness, and prior experience.

Age

The amount of time required to adapt to a new level of activity probably depends on age. Youth and young adults probably can safely increase activity by small amounts every week or 2. Older adults appear to require more time to adapt to a new level of activity, in the range of 2 to 4 weeks.

Level of Fitness

Less fit adults are at higher risk of injury when doing a given amount of activity, compared to fitter adults. Slower rates of increase over time may reduce injury risk. This guidance applies to overweight and obese adults, as they are commonly less physically fit.

Prior Experience

People can use their experience to learn to increase physical activity over time in ways that minimize the risk of overuse injury. Generally, if an overuse injury occurred in the past with a certain rate of progression, a person should increase activity more slowly the next time.

Take Appropriate Precautions

Taking appropriate precautions means using the right gear and equipment, choosing safe environments in which to be active, following rules and policies, and making sensible choices about how, when, and where to be active.

Use Protective Gear and Appropriate Equipment

Using personal protective gear can reduce the frequency of injury. Personal protective gear is something worn by a person to protect a specific body part. Examples include helmets, eyewear and goggles, shin guards, elbow and knee pads, and mouth guards.

Using appropriate sports equipment can also reduce risk of injury. Sports equipment refers to sport or activity-specific tools, such as balls, bats, sticks, and shoes.

For the most benefit, protective equipment and gear should be:

- The right equipment for the activity;
- Appropriately fitted;
- Appropriately maintained; and
- Used consistently and correctly.

Be Active in Safe Environments

People can reduce their injury risks by paying attention to the places they choose to be active. To help themselves stay safe, people can look for:

- Physical separation from motor vehicles, such as sidewalks, walking paths, or bike lanes;
- Neighborhoods with traffic-calming measures that slow down traffic;
- Places to be active that are well-lighted, where other people are present, and that are well-maintained (no litter, broken windows);
- Shock-absorbing surfaces on playgrounds;
- Well-maintained playing fields and courts without holes or obstacles;
- Breakaway bases at baseball and softball fields; and
- Padded and anchored goals and goal posts at soccer and football fields.

Follow Rules and Policies That Promote Safety

Rules, policies, legislation, and laws are potentially the most effective and wide-reaching way to reduce activity-related injuries. To get the benefit, individuals should look for and follow these rules, policies, and laws. For example, policies that promote the use of bicycle helmets reduce the risk of head injury among cyclists. Rules against diving into shallow water at swimming pools prevent head and neck injuries.

Make Sensible Choices About How, When, and Where To Be Active

A person's choices can obviously influence the risk of adverse events. By making sensible choices, injuries and adverse events can be prevented. Consider weather conditions, such as extremes of heat and cold. For example, during very hot and humid weather, people lessen the chances of dehydration and heat stress by:

- Exercising in the cool of early morning as opposed to mid-day heat;
- Switching to indoor activities (playing basketball in the gym rather than on the playground);
- Changing the type of activity (swimming rather than playing soccer);
- Lowering the intensity of activity (walking rather than running); and
- Paying close attention to rest, shade, drinking enough fluids, and other ways to minimize effects of heat.

Exposure to air pollution is associated with several adverse health outcomes, including asthma attacks and abnormal heart rhythms. People who can modify the location or time of exercise may wish to reduce these risks by exercising away from heavy traffic and industrial sites, especially during rush hour or times when pollution is known to be high. However, current evidence indicates that the benefits of being active, even in polluted air, outweigh the risk of being inactive.

Inactive people who gradually progress over time to relatively moderate-intensity activity have no known risk of sudden cardiac events, and very low risk of bone, muscle, or joint injuries.

Advice From Health-Care Providers

The protective value of a medical consultation for persons with or without chronic diseases who are interested in increasing their physical activity level is not established. People without diagnosed chronic conditions (such as diabetes, heart disease, or osteoarthritis) and who do not have symptoms (such as chest pain or pressure, dizziness, or joint pain) do not need to consult a health-care provider about physical activity.

Inactive people who gradually progress over time to relatively moderate-intensity activity have no known risk of sudden cardiac events, and very low risk of bone, muscle, or joint injuries. A person who is habitually active with moderate-intensity activity can gradually increase to vigorous intensity without needing to consult a health-care provider. People who develop new symptoms when increasing their levels of activity should consult a health-care provider.

Health-care providers can provide useful personalized advice on how to reduce risk of injuries. For people who wish to seek the advice of a health-care provider, it is particularly appropriate to do so when contemplating vigorous-intensity activity, because the risks of this activity are higher than the risks of moderate-intensity activity.

The choice of appropriate types and amounts of physical activity can be affected by chronic conditions. People with symptoms or known chronic conditions should be under the regular care of a health-care provider. In consultation with their provider, they can develop a physical activity plan that is appropriate for them. People with chronic conditions typically find that moderate-intensity activity is safe and beneficial. However, they may need to take special precautions. For example, people with diabetes need to pay special attention to blood sugar control and proper footwear during activity.

Women who are pregnant and those who've recently had a baby should be under the regular care of a health-care provider. Moderate-intensity physical activity is generally safe for women with uncomplicated pregnancies, but women should talk with their provider about how to adjust the amounts and types of activity while they are pregnant and right after the baby's birth.

During pregnancy, women should avoid:

- Doing activities that involve lying on their back after the first trimester of pregnancy
- Doing activities with high risk of falling or abdominal trauma, including contact or collision sports, such as horseback riding, soccer, basketball, and downhill skiing

Gradually Increasing Physical Activity Over Time: Real-Life Examples

Here are two examples that show how people at different ages, levels of fitness, and levels of experience can safely become more active over time.

Bill: A Man Who Has Been Inactive for Many Years

Bill wants to work his way up to the equivalent of 180 to 210 minutes (3 hours to 3 hours and 30 minutes) of walking a week. On weekdays he has time for up to 45 minutes of walking, and he plans to do something physically active each weekend. He decides to start with walking because it is moderate intensity and has a low risk of injury.

- The first week, Bill starts at a low level. He walks 10 minutes a day 3 days a week. Sometimes he divides the 10 minutes a day into two sessions. He prefers to alternate rest days and active days. (Total = 30 minutes a week.)

- Between weeks 3 and 8, Bill increases duration by adding 5 minutes a day and continues walking on 3 non-consecutive days each week. The weekly increase is 15 minutes. (Week 3 total = 45 minutes. Week 8 total = 120 minutes or 2 hours.)
- In week 9, Bill adds another day of moderate-intensity activity on the weekend, and starts doing a variety of activities, including biking, hiking, and an aerobics class. Gradually increasing the minutes of activity, by week 12 he is doing 60 minutes or more of moderate-intensity activity on the weekend.

Reaching his goal: Over 3 months, Bill has increased to a total of 180 moderate-intensity minutes a week.

Kim: An Active Woman

Kim currently does 150 minutes (2 hours and 30 minutes) a week of moderate-intensity activity. She wants to work up to at least the equivalent of 300 minutes (5 hours) of moderate-intensity activity a week. She also wants to shift some of that moderate-intensity activity to vigorous-intensity activity. Her current 150 minutes a week includes:

- Thirty minutes of mowing the grass 1 day a week;
- Thirty minutes of brisk walking 4 days a week; and
- Fifteen minutes of muscle-strengthening exercises 2 days a week.

Increasing frequency and duration: Over a month, Kim adds walking on another weekday, and she gradually adds 15 minutes of moderate-intensity activity on each of the 5 walking days each week. This provides an additional 105 minutes (1 hour and 45 minutes) of moderate-intensity activity.

Increasing intensity: Over the next month, Kim decides to replace some walking with jogging. Instead of walking 45 minutes, she walks for 30 minutes and jogs for 15 minutes on each weekday, providing the equivalent of 300 minutes a week of moderate-intensity physical activity from her walking and jogging.

Reaching her goal: After these increases, Kim is doing a total of 180 minutes of moderate-intensity activity each week (walking and mowing) and also doing 75 minutes (1 hour and 15 minutes) of vigorous-intensity jogging. One minute of vigorous-intensity activity is about the same as 2 minutes of moderate-intensity activity, so she is now doing the equivalent of 330

moderate-intensity minutes (5 hours and 30 minutes) a week. She has more than met her goal.

Next> Warm-Up and Cool-Down

Class 2-1: Planning for Fitness

Warm-up and Cool-down

The following has been excerpted and adapted from the Penn State Extension article Warm-up and Cool-down under fair use:

Warm-up

The purpose of a warm-up is to warm your body and prepare it for the exercises to come. Usually a warm-up will consist of activities at a slower pace and reduced intensity. The goal of a warm-up is to increase your body temperature, therefore warming up your muscles. Blood flow and flexibility will increase during a warm-up. The warm-up may cause mild sweating, but it shouldn't leave you tired or fatigued.

During a warm-up, your heart rate and breathing will increase. A warm-up also promotes blood flow to your muscles to provide them with more oxygen and nutrients so they don't get fatigued. Your muscles also warm up, which increases muscle flexibility and makes exercises easier to complete. By preparing your muscles for exercise, your reaction time is increased and nerve pathways are ready for exercise.

In addition to all the physical benefits of a warm-up, it also prepares you mentally for the upcoming exercises. Warm-ups can consist of a variety of exercises and stretches. Contradictory to many beliefs, solely stretching as a warm-up will not warm you up properly. Instead, a dynamic warm-up (also called dynamic stretching) is more effective. Instead of holding still while stretching (also called static stretching), during a dynamic warm-up you move multiple muscles and joints.

A warm-up should last approximately 5 to 10 minutes. Choose a warm-up that mimics the exercises you will be doing. For example, if you are about to participate in weight lifting exercises, do the same movements without the weights. Some other examples of warm-up exercises are leg bends, leg swings, shoulder/ arm circles, jumping jacks, jumping rope, lunges, squats, walking or a slow jog, yoga, torso twists, standing side bends, lateral shuffle, butt kickers, knee bends, and ankle circles.

Advantages of Warming Up

- Decreases your chance of pulling a muscle
- Decreases joint pain
- Decreases your chance of injury
- Can reduce muscle soreness after exercises are complete

Cool-down

Similar to the warm-up, the cool-down, also known as the recovery period, usually consists of exercises at a slower pace and reduced intensity. This allows for your heart rate, breathing, and blood pressure to return to normal at a slower pace. The cool-down aids in your body's recovery after exercise and allows blood to return to your heart from your muscles. This will reduce the chance of your muscles being sore after exercise.

Completing a cool-down is not only beneficial immediately after the completion of exercises but also helps prepare your body for future workouts. By stretching out those muscles and properly cooling down, you will be more prepared to exercise sooner rather than later. If your body does not cool down properly, it will take longer for you to feel up to exercising again. All of the examples of warm-up exercises can also be used as cool-down exercises.

There are several benefits of a cool-down. It reduces the potential for DOMS (delayed onset muscle soreness). It can take 24 to 48 hours for your body to feel sore after exercising. Just because your muscles and joints may not be sore immediately after you've completed your exercises doesn't mean you won't feel sore later that day or the next day. A cool-down helps your body remove lactic acid, a by-product of vigorous exercise. If you do not cool down, the lactic acid may pool in your muscles, causing increased soreness.

Benefits of Cooling Down

- Helps lower your heart rate and breathing gradually
- Helps you avoid fainting or dizziness
- Helps prepare your muscles for the next time you exercise

Next> Overcoming Barriers to Physical Activity

Class 2-1: Planning for Fitness

Overcoming Barriers to Physical Activity

The following has been excerpted and adapted from Lifetime Fitness and Wellness (Lumen) under fair use:

Overcoming Barriers to Physical Activity

Given the health benefits of regular physical activity, we might have to ask why two out of three (60%) Americans are not active at recommended levels.

Many technological advances and conveniences that have made our lives easier and less active, as well as many personal variables, including physiological, behavioral, and psychological factors, may affect our plans to become more physically active. In fact, the 10 most common reasons adults cite for not adopting more physically active lifestyles are (Sallis and Hovell, 1990; Sallis et al., 1992):

- Do not have enough time to exercise
- Find it inconvenient to exercise
- Lack self-motivation
- Do not find exercise enjoyable
- Find exercise boring
- Lack confidence in their ability to be physically active (low self-efficacy)
- Fear being injured or have been injured recently
- Lack self-management skills, such as the ability to set personal goals, monitor progress, or reward progress toward such goals
- Lack encouragement, support, or companionship from family and friends, and
- Do not have parks, sidewalks, bicycle trails, or safe and pleasant walking paths convenient to their homes or offices.

Understanding common barriers to physical activity and creating strategies to overcome them may help you make physical activity part of your daily life.

Suggestions for Overcoming Physical Activity Barriers

Lack of time	Identify available time slots. Monitor your daily activities for one week. Identify at least three 30-minute time slots you could use for physical activity. Add physical activity to your daily routine. For example, walk or ride your bike to work or shopping, organize school activities around physical activity, walk the dog, exercise while you watch TV, park farther away from your destination, etc. Select activities requiring minimal time, such as walking, jogging, or stairclimbing.
Social influence	Explain your interest in physical activity to friends and family. Ask them to support your efforts. Invite friends and family members to exercise with you. Plan social activities involving exercise. Develop new friendships with physically active people. Join a group, such as the YMCA or a hiking club.
Lack of energy	Schedule physical activity for times in the day or week when you feel energetic. Convince yourself that if you give it a chance, physical activity will increase your energy level; then, try it.
Lack of motivation	Plan ahead. Make physical activity a regular part of your daily or weekly schedule and write it on your calendar. Invite a friend to exercise with you on a regular basis and write it on both your calendars. Join an exercise group or class.

Fear of injury	Learn how to warm up and cool down to prevent injury.
	Learn how to exercise appropriately considering your age, fitness level, skill level, and health status.
	Choose activities involving minimum risk.
Lack of skill	Select activities requiring no new skills, such as walking, climbing stairs, or jogging.
	Take a class to develop new skills.
Lack of resources	Select activities that require minimal facilities or equipment, such as walking, jogging, jumping rope, or calisthenics.
	Identify inexpensive, convenient resources available in your community (community education programs, park and recreation programs, worksite programs, etc.).
Weather conditions	Develop a set of regular activities that are always available regardless of weather (indoor cycling, aerobic dance, indoor swimming, calisthenics, stair climbing, rope skipping, mall walking, dancing, gymnasium games, etc.)
Travel	Put a jump rope in your suitcase and jump rope.
	Walk the halls and climb the stairs in hotels.
	Stay in places with swimming pools or exercise facilities.
	Join the YMCA or YWCA (ask about reciprocal membership agreement).
	Visit the local shopping mall and walk for half an hour or more.
	Bring your mp3 player your favorite aerobic exercise music.

Family obligations	Trade babysitting time with a friend, neighbor, or family member who also has small children. Exercise with the kids-go for a walk together, play tag or other running games, get an aerobic dance or exercise tape for kids (there are several on the market) and exercise together. You can spend time together and still get your exercise. Jump rope, do calisthenics, ride a stationary bicycle, or use other home gymnasium equipment while the kids are busy playing or sleeping. Try to exercise when the kids are not around (e.g., during school hours or their nap time).
Retirement years	Look upon your retirement as an opportunity to become more active instead of less. Spend more time gardening, walking the dog, and playing with your grandchildren. Children with short legs and grandparents with slower gaits are often great walking partners. Learn a new skill you've always been interested in, such as ballroom dancing, square dancing, or swimming. Now that you have the time, make regular physical activity a part of every day. Go for a walk every morning or every evening before dinner. Treat yourself to an exercycle and ride every day while reading a favorite book or magazine.

Content in the "Personal Barriers" section was taken from *Promoting Physical Activity: A Guide for Community Action* (USDHHS, 1999).

Next>Summary

Class 2-1: Planning for Fitness

Summary

Major Points

During today's class, you have learned:

- Health Benefits of Physical Activity
  - Regular physical activity is one of the most important things you can do for your health.
  - Exercise is a form of physical activity that is planned, structured, repetitive, and performed with the goal of improving health or fitness.
  - Both have direct benefits:
    - Control your weight
    - Reduce your risk of cardiovascular disease
    - Reduce your risk for type 2 diabetes and metabolic syndrome
    - Reduce your risk of some cancers
    - Strengthen your bones and muscles
    - Improve your mental health and mood
    - Improve your ability to do daily activities and prevent falls
    - Increase your chances of living longer
- Transtheoretical Model
  - Describes how people go about changing a behavior.
    - Precontemplation
    - Contemplation
    - Determination
    - Action
    - Relapse
    - Maintenance
- S.M.A.R.T. Acronym for successful goal setting
  - Specific
  - Measurable
  - Attainable
  - Realistic
  - Timely
- Seven Principles of Adaptation for Exercise Planning
  - Individuality

    - Specificity
    - Overload
    - Progression
    - Diminishing Returns
    - Reversibility
    - Rest and Recovery
- F.I.T.T.
    - Frequency, Intensity, Type, Time
- Guidelines for Safe Activity
    - Understand the relative risk of activity compared to inactivity
    - Choose activities and intensities appropriate to your current level
    - Start slow and increase activity gradually over time
    - Discuss with your medical professionals based on your unique needs
- Warm-Up

    - Decreased chance of injury
- Cool Down
    - Helps safety and recovery
- Overcoming Barriers
    - Understanding common barriers to physical activity and creating strategies to overcome them may help you make physical activity part of your daily life.

Class 2-2: Cardiovascular Health

Overview

Today's Class Overview

In today's class, you will learn about the cardiovascular system and how to plan for effective cardiovascular exercise.

Today's Class Objectives

By the end of this module you should be able to:

1. Describe the basic physiology of the cardiovascular system.
2. Identify methods of measuring intensity during cardiovascular exercise.
3. Find your heart rate with no equipment.
4. Summarize how time in nature benefits wellness.

Outline of Today's Class

- Materials
    1. Overview
    2. Review
    3. The Cardiovascular System
    4. Measuring Intensity and Planning
    5. Heart Disease 101
    6. How to Check Your Heart Rate
    7. Nature and Wellness
    8. Summary

Next>Review

Class 2-2: Cardiovascular Health

Review

Reviewing 2-1: Planning for Fitness

- Health Benefits of Physical Activity
  - Regular physical activity is one of the most important things you can do for your health.
  - Exercise is a form of physical activity that is planned, structured, repetitive, and performed with the goal of improving health or fitness.
  - Both have direct benefits:
    - Control your weight
    - Reduce your risk of cardiovascular disease
    - Reduce your risk for type 2 diabetes and metabolic syndrome
    - Reduce your risk of some cancers
    - Strengthen your bones and muscles
    - Improve your mental health and mood
    - Improve your ability to do daily activities and prevent falls
    - Increase your chances of living longer
- Transtheoretical Model
  - Describes how people go about changing a behavior.
    - Precontemplation
    - Contemplation
    - Determination
    - Action
    - Relapse
    - Maintenance
- S.M.A.R.T. Acronym for successful goal setting
  - Specific
  - Measurable
  - Attainable
  - Realistic
  - Timely
- Seven Principles of Adaptation for Exercise Planning
  - Individuality
  - Specificity
  - Overload

    - Progression
    - Diminishing Returns
    - Reversibility
    - Rest and Recovery
- F.I.T.T.
    - Frequency, Intensity, Type, Time
- Guidelines for Safe Activity
    - Understand the relative risk of activity compared to inactivity
    - Choose activities and intensities appropriate to your current level
    - Start slow and increase activity gradually over time
    - Discuss with your medical professionals based on your unique needs
- Warm-Up
    - Decreased chance of injury
- Cool Down
    - Helps safety and recovery
- Overcoming Barriers
    - Understanding common barriers to physical activity and creating strategies to overcome them may help you make physical activity part of your daily life.

Next>The Cardiovascular System

Class 2-2: Cardiovascular Health

The Cardiovascular System

The following has been excerpted and adapted from Concepts of Fitness and Wellness, 2nd Edition, Georgia Highlands College (CC BY-NC-SA) under fair use:

What is the cardiovascular and respiratory system?

Imagine for a moment climbing to the top of Mt. Everest, a challenging feat very few have accomplished. In the process, you gradually ascend from base camp, which sits at about 17,500 feet above sea level, to the peak at over 29,000 feet. At this elevation, the pressure of oxygen is so low, you struggle to take in a satisfying breath. Although you strive to breathe deeply, you are unable to get enough air. Your heart rate increases and you might even develop nausea and a headache. Unless your body has a chance to acclimate itself to higher elevations or you gain access to supplemental oxygen, your symptoms will persist or worsen.

These are the sensations many people with cardiovascular or respiratory illnesses, such as asthma, chronic bronchitis, or mild cardiovascular disease, experience on a daily basis. Climbing up a flight of steps may leave them gasping for air, as would walking briskly or even breathing in cold air. Regardless of the cause, being unable to take in sufficient air can create a sense of panic and cause serious physical discomfort.

From this simple example, hopefully, you feel an appreciation for the simple act of breathing and ensuing satisfaction that comes with each life-sustaining breath. For most people, unless they engage in strenuous physical activity sufficient to get them breathing hard, their **cardiovascular and respiratory system** (heart, blood vessels, and lungs) operates efficiently enough to go relatively unnoticed. However, does that mean their cardiorespiratory (CR) system is functioning at optimal capacity? Or, could it be operating at a minimum level and experiencing problems that go undetected? This chapter defines cardiorespiratory fitness, examines the benefits of a healthy CR system, and explores how to effectively assess and improve the CR system.

The CR System and Energy Production

Clearly the cardiovascular and respiratory systems function as one, but why is the CR system so important? What makes the distribution of oxygen throughout the body so vital to existence? The answer is simple: ENERGY. While oxygen in and of itself does not contain any energy (**calories**), it does combine with fuel extracted from food once it has been introduced into the cell to help produce **adenosine triphosphate** (ATP). ATP is the basic form of cellular energy found in the body. Because the body stores very little ATP, it must constantly be regenerated. For this reason, people must continue eating and breathing to live.

Within the context of fitness, the purpose of the cardiorespiratory system is not only to produce energy but to also adapt in a way so that energy production can be optimized. For example, a high school cross country runner wants to be fit enough to compete in the state cross country meet. Unfortunately, this athlete's current mile times are 6 minutes per mile. In other words, that is the maximum work rate possible for this athlete. However, the goal is to improve to 5 minutes per mile, or improve the maximum work rate. To do so, more energy must be produced. According to the principles of adaptation, it is possible for this athlete to become more efficient at producing energy, enabling him to run a mile in less time. An example of this adaptation comes from the world record mile time of 3 minutes and 43 seconds. The world record marathon time (26.2 miles) is 2 hours, 2 minutes, and 52 seconds. That equates to 4 minutes and 41 seconds per mile over the 26-mile course. That is some serious ATP production!

Oxidative Energy System (Aerobic)

As oxygen and nutrients are delivered to the cells, they are utilized to produce ATP. The workhorses of the cell for oxidative metabolism are the **mitochondria**. This form of energy production is contingent on the ability of the CR system to deliver oxygen and nutrients and the cell's ability to process that oxygen. Because of the importance of oxygen in this particular energy-producing pathway, it is called the oxidative energy system, or **aerobic system**.

Oxidative energy production is the primary means of ATP production during rest and for activities that last for 2 minutes or longer. Although other forms of energy production assist in ATP production at any given time, long duration exercise sessions rely on this aerobic pathway. Also, in contrast to other forms of ATP production, the oxidative energy system uses both carbohydrates and fats for fuel sources.

Immediate/Explosive Energy System

While the oxidative system is the primary source of ATP production, it does require a few minutes for the system to begin operating at full capacity during exercise. How then could the body immediately produce enough energy to perform a strenuous activity, such as sprinting 50 meters? Clearly, another energy system must drive ATP production. The immediate or explosive energy system utilizes the storage of **creatine phosphate** (CP) and the storage of **adenosine diphosphate**, which is stored in very small amounts, to generate ATP. When needed, this energy system provides enough ATP to sustain a short-duration, explosive activity, approximately 10–20 seconds or less. Once CP is depleted, other energy systems must assist in the ATP generating process.

Non-Oxidative or Anaerobic Energy System

As the name implies, the **non-oxidative energy system** does not require oxygen to generate ATP. Instead, the cells where the ATP is produced require **glucose** (carbohydrates that have been broken down) as the fuel source. Like the immediate energy system, this system is associated with high intensity and short duration movements. While it is possible for some elite athletes to maintain exercise at "anaerobic" levels for several minutes, even they will eventually fatigue as a result of the non-oxidative system's ability to sustain ATP production for events lasting longer than approximately 2 minutes.

As glucose is processed to produce ATP, the natural byproduct of this process, lactic acid, also begins to accumulate. The result of excessive lactic acid accumulation contributes to muscle fatigue, making it impossible to continue exercise at a high intensity.

Energy Systems Combine

It is important to understand that energy systems do not operate in a compartmental fashion, but rather operate simultaneously, each carrying some of the burden of ATP production. For example, a professional soccer player would spend most of the match "cruising" at a light/moderate intensity level, thus primarily utilizing the oxidative energy system. However, during the match, he or she may sprint for several hundred meters, utilizing the explosive and non-oxidative system, or he or she may jump, requiring use of the explosive system. Thus, both energy systems are utilized simultaneously throughout the match. To improve performance, this player would need to develop the energy system which is utilized the most during the match.

Next>Measuring Intensity and Planning

Class 2-2: Cardiovascular Health

Measuring Intensity and Planning

***The following has been excerpted and adapted from Concepts of Fitness and Wellness, 2nd Edition, Georgia Highlands College* (CC BY-NC-SA):**

Assessing CR Fitness

To adequately prepare for starting a personal fitness program, it is important to first assess your current level of fitness. There are multiple methods for assessing a person's level of fitness. Each of the walking/jogging assessments discussed here attempts to estimate a key physiological marker of the heart's and lungs' functioning capacity and maximal oxygen consumption. M**aximal oxygen consumption**, or $VO_{2\ max}$, measures the body's maximum ability to take in and utilize oxygen, which directly correlates to overall health and fitness. A good estimate of $VO_{2\ max}$ provides a one-time glance at a person's health and fitness level and a baseline measurement for reassessment at future dates to gauge improvements.

Some of the most common walking/jogging assessments used to estimate $VO_{2\ max}$ include the 12-Minute Walk, 1.5-Mile Run/Walk Test, 3-Minute Step Test, and 1-Mile Walk Test. Unfortunately, these field assessments, although practical and inexpensive, only provide estimations. More accurate assessments require a lab-based VO_{2max} test using equipment that measures the volume of oxygen and carbon dioxide being moved in and out of the air passages during exercise. Although this test is more accurate, the expense and availability make it impractical for most. Unlike the lab test, the field assessments are relatively cost free, user-friendly and require very little expertise to conduct or perform. In addition, the key point of the assessment is measuring differences rather than absolute values, and the field tests accurately meet that objective.

Creating a Plan to Develop CR Fitness

Once the assessments have been completed, the next step is to develop a plan for maintaining or improving your current level of fitness. This fitness plan should include activities that are safe and adapted to meet your personal goals. Once these fitness goals have been identified, the principles of adaptation to change can be utilized to achieve those goals. These principles include **specificity**, targeting specific areas in a workout, and **overload,** the practice of increasing exertion as the body adapts to ensure continued gains in fitness levels. Specifically, you need to apply the FITT principle (**F**itness, **I**ntensity, **T**ime, and **T**ype) described in detail in the previous chapter, "Fitness Principles":

- **Frequency**: 3–5 days per week for healthy adults.
- **Intensity**: moderate to vigorous intensity, which equals 40–85% of heart rate reserve, or 55–90% of percentage of max heart rate. (More information about intensity will be provided later.)
- **Time/duration**: 20–60 minutes per session or accumulation of 150 minutes per week. Sessions must be continuous for 10 minutes or more.
- **Type/mode**: Use large muscle groups and exercises specific to cardiorespiratory exercise.

Click on the link below for ACSM's latest recommendations on the quantity and quality of exercise for adults:

ACSM's Official News Release

Measuring Intensity

Intensity may be the most important aspect of the FITT principle. Engaging in a "cardio" program that does not stress the CR system to the recommended levels will be ineffective. Engaging in a program that overstresses the system can lead to injury and pose unnecessary risks. So how do you know if you are in the right range?

Heart rate is one of the best ways to measure effort level. Walking and jogging increase a person's heart rate. Based on the function of the heart, this is no surprise. The heart rate directly correlates with the amount of oxygen being taken in by the lungs. As activity increases in intensity, oxygen demands increase and so does heart rate.

Because of this relationship, heart rate can be used in the design of an effective walking and jogging program by creating target heart rate zones. Heart rate zones represent an intensity range—a low end heart rate and a high end rate—within which a person's heart rate would fall during a walking or jogging session.

The first step in determining your **target heart rate (THR)**, is to determine your **maximum heart rate (MHR),** both measured in beats per minute (bpm). Generally, MHR is estimated to be your age subtracted from 220 beats per minute. In other words, your heart rate should theoretically stop increasing once it reaches the calculated maximum. While helpful, it is not uncommon to see variances in the laboratory tested maximum heart rate versus the calculated method.

The next step in calculating THR is to calculate a specific percentage of your MHR. This is done using two different methods. Keep in mind, finding the THR is the objective in both methods, even though slightly different numbers are used.

The first method, called Max Heart Rate Method, is more commonly used.

MAX HEART RATE METHOD

1. Calculate MHR;

MHR = 220 – age.

1. Calculate high and low THR by plugging in a percentage range. In this example, 60 and 80% are being used.

MHR x .60 = THR_{Low}

MHR x .80 =THR_{High}

1. The resulting low and high THR numbers represent the range, or target intensity.

The target intensity signifies an optimal training zone for that particular walking or jogging session. By keeping the heart rate within that range, you will drive adaptation specific to that intensity. By using real, but random numbers, and plugging them into the above equation this becomes apparent.

Female, aged 20:

1. MHR = 220 -20

MHR = 200 bpm;

1. THR_{low} = 200 x .60

THR_{low} = 120 bpm

THR_{high} =200 x .80

THR_{high} = 160 bpm

1. THR = 120 - 160 bpm

To achieve her self-established goals, the female in the example above will need to stay within the range of 120 and 160 bpm. If her efforts are intense enough that she begins to exceed 160 bpm during her session, or easy enough that her heart rate falls below 120 bpm, she would need to change her intensity mid-session to get the optimal results.

OTHER WAYS TO DETERMINE INTENSITY

Since not everyone owns a heart rate monitor, other methods of determining exercise intensity have been developed. One particular method, called the **rating of perceived exertion (RPE)**, uses subjective measurement to determine intensity. The method is as simple as asking the question, Overall, how hard do I feel I am working? The answer is given based on a scale of 6 to 20 with 6 being almost no effort and 20 being maximum effort. Studies have indicated that when subjects are asked to exercise at a moderate or heavy intensity level, subjects can accurately do so, even without seeing their heart rate. As a result, using the RPE scale can be an effective way of managing intensity.

The original RPE scale or **Borg Scale**, designed by Dr. Gunnar Borg, was developed to mimic generalized heart rate patterns. The starting and ending point of the scale are less intuitive than a typical scale of 1-10. By design, the 6 represents a resting heart rate of 60 bpm and the 20 an exercise heart rate of 200 bpm, a beat count someone might experience at maximum effort. Over time, a modified Borg Scale was developed using a simple 1–10 scale, with 1 being resting effort and 10 being maximum effort. Even though the modified scale is more intuitive, the traditional scale is still used more frequently.

Walking and jogging not only benefit physical health, but many enjoy the social benefits realized by exercising with friends. When walking or jogging with friends, intensity can easily be measured by monitoring your ability to carry on a conversation. With the **Talk Test**, if you are only able to say short phrases or give one word responses when attempting to converse during an exercise session, this would suggest you are working at a high enough intensity that your breathing rate makes conversation difficult. Certainly, if you can speak in full sentences without getting winded, the intensity would be very light. Just like RPE, the Talk Test is yet another way to subjectively measure intensity, which can then be correlated with heart rates.

Next>Heart Disease 101 and How to Take Your Heart Rate

The next two pages will provide an overview of heart disease, which we explored earlier in the course, and how to take your heart rate easily with no technology.

Class 2-2: Cardiovascular Health

Heart Disease 101

Review this infographic from the University of Florida to learn Heart Disease 101.

Next> How to Check Your Heart Rate

Class 2-2: Cardiovascular Health

How to Check Your Heart Rate

Visit MOVE: How to Take Your Heart Rate to learn how to quickly and easily check your heart rate.

Next>Nature and Wellness

Class 2-2: Cardiovascular Health

Nature and Wellness

Excerpted and adapted from "Nurtured by Nature" via the American Psychological Association under fair use:

How Does Nature Impact Our Wellbeing?

By Kirsten Weir Date created: April 1, 20201 2 min read Vol. 51, No. 3

Our increasing reliance on technology, combined with a global trend toward urban living, means many of us are spending ever less time outdoors—even as scientists compile evidence of the value of getting out into the natural world.

Exposure to nature has been linked to a host of benefits, including improved attention, lower stress, better mood, reduced risk of psychiatric disorders and even upticks in empathy and cooperation.

"There is mounting evidence, from dozens and dozens of researchers, that nature has benefits for both physical and psychological human well-being," says Lisa Nisbet, PhD, a psychologist at Trent University in Ontario, Canada, who studies connectedness to nature. "You can boost your mood just by walking in nature, even in urban nature. And the sense of connection you have with the natural world seems to contribute to happiness even when you're not physically immersed in nature."

In a review of the research, Gregory Bratman, PhD, an assistant professor at the University of Washington, and colleagues shared evidence that contact with nature is associated with increases in happiness, subjective well-being, positive affect, positive social interactions and a sense of meaning and purpose in life, as well as decreases in mental distress (*Science Advances*, Vol. 5, No. 7, 2019).

1. Spending time in nature is linked to both cognitive benefits and improvements in mood, mental health and emotional well-being.
2. Feeling connected to nature can produce similar benefits to well-being, regardless of how much time one spends outdoors.
3. Both green spaces and blue spaces (aquatic environments) produce well-being benefits. More remote and biodiverse spaces may be

particularly helpful, though even urban parks and trees can lead to positive outcomes.

Next>Summary

Class 2-2: Cardiovascular Health

Summary

Major Points

During today's class, you have learned:

- Cardiovascular System
  - Heart, Blood Vessels, Lungs
  - Provides oxygen needed to help convert food into usable energy
- Three Major Energy Systems
  - Work together to provide energy
    - Oxidative (With oxygen) - 2 minutes or longer of activity
    - Anaerobic (Without oxygen) - 30 to 120 seconds of activity
    - Immediate (Creatine phosphate) - 10 - 20 seconds of activity
- ACSM Recommendations
  - **Frequency**: 3–5 days per week for healthy adults.
  - **Intensity**: moderate to vigorous intensity, which equals 40–85% of heart rate reserve, or 55–90% of percentage of max heart rate.
  - **Time/duration**: 20-–-60 minutes per session or accumulation of 150 minutes per week. Sessions must be continuous for 10 minutes or more.
  - **Type/mode**: Use large muscle groups and exercises specific to cardiorespiratory exercise.
- Heart Rate
  - Useful for tracking intensity of cardiovascular exercise using a target percentage of maximum heart rate.
- Rating of Perceived Exertion
  - Scale of perceived intensity
- Exposure to Nature
  - Linked to improved attention, lower stress, better mood, reduced risk of psychiatric disorders and even upticks in empathy and cooperation.

Class 2-3: Muscular Fitness

Overview

Today's Class Overview

In today's class, you will learn about the structure of muscles, recommendations for safe and effective resistance training, and positive self-talk.

Today's Class Objectives

By the end of this module you should be able to:

1. Describe the basic physiology of the muscular system.
2. Plan an exercise routine following recommendations for safe and effective resistance exercise.
3. Determine how many repetitions of an exercise to perform for a desired adaptation.
4. Define and apply the concept of "self-talk."

Outline of Today's Class

- Materials
    - Overview
    - Review
    - The Muscular System
    - Resistance Training Recommendations
    - Repetitions and Sets
    - Self-Talk
    - Summary

Next>Review

Class 2-3: Muscular Fitness

Review

Reviewing 2-2: Cardiovascular Health

- Cardiovascular System
  - Heart, Blood Vessels, Lungs
  - Provides oxygen needed to help convert food into usable energy
- Three Major Energy Systems
  - Work together to provide energy
    - Oxidative (With oxygen) - 2 minutes or longer of activity
    - Anaerobic (Without oxygen) - 30 to 120 seconds of activity
    - Immediate (Creatine phosphate) - 10 - 20 seconds of activity
- ACSM Recommendations
  - **Frequency**: 3–5 days per week for healthy adults.
  - **Intensity**: moderate to vigorous intensity, which equals 40–85% of heart rate reserve, or 55–90% of percentage of max heart rate.
  - **Time/duration**: 20-–-60 minutes per session or accumulation of 150 minutes per week. Sessions must be continuous for 10 minutes or more.
  - **Type/mode**: Use large muscle groups and exercises specific to cardiorespiratory exercise.
- Heart Rate
  - Useful for tracking intensity of cardiovascular exercise using a target percentage of maximum heart rate.
- Rating of Perceived Exertion
  - Scale of perceived intensity
- Exposure to Nature
  - Linked to improved attention, lower stress, better mood, reduced risk of psychiatric disorders and even upticks in empathy and cooperation.

Next>The Muscular System

Class 2-3: Muscular Fitness

The Muscular System

The following has been excerpted and adapted from Concepts of Fitness and Wellness, 2nd Edition, Georgia Highlands College (CC BY-NC-SA):

Skeletal Muscle Structure and Function

Skeletal muscles are attached to the skeleton and are responsible for the movement of our limbs, torso, and head. They are under conscious control, which means that we can consciously choose to contract a muscle and can regulate how strong the contraction actually is. Skeletal muscles are made up of a number of **muscle fibers**. Each muscle fiber is an individual muscle cell and may be anywhere from 1 mm to 4 cm in length. When we choose to contract a muscle fiber—for instance we contract our bicep to bend our arm upwards—a signal is sent from our brain via the spinal cord to the muscle. This signals the muscle fibers to contract. Each nerve will control a certain number of muscle fibers. The nerve and the fibers it controls are called a **motor unit**. Only a small number of muscle fibers will contract to bend one of our limbs, but if we wish to lift a heavy weight then many more muscles fibers will be recruited to perform the action. This is called muscle fiber recruitment.

Each muscle fiber is surrounded by connective tissue called an external lamina. A group of muscle fibers are encased within more connective tissue called the endomysium. The group of muscle fibers and the endomysium are surrounded by more connective tissue called the perimysium. A group of muscle fibers surrounded by the perimysium is called a muscle fasciculus. A muscle is made up of many muscle fasciculi, which are surrounded by a thick collagenous layer of connective tissue called the epimysium.

The epimysium covers the whole surface of the muscle.

Muscle fibers also contain many mitochondria, which are energy powerhouses that are responsible for the aerobic production of energy molecules, or ATP molecules. Muscle fibers also contain glycogen granules as a stored energy source, and **myofibrils**, which are threadlike

structures running the length of the muscle fiber. Myofibrils are made up of two types of protein: 1) Actin myofilaments, and 2) myosin myofilaments. The actin and myosin filaments form the contractile part of the muscle, which is called the sarcomere. Myosin filaments are thick and dark when compared with actin filaments, which are much thinner and lighter in appearance. The actin and myosin filaments lie on top of one another; it is this arrangement of the filaments that gives muscle its striated or striped appearance. When groups of actin and myosin filaments are bound together by connective tissue they make the myofibrils. When groups of myofibrils are bound together by connective tissue, they make up muscle fibers.

The ends of the muscle connect to bone through a tendon. The muscle is connected to two bones in order to allow movement to occur through a joint. When a muscle contracts, only one of these bones will move. The point where the muscle is attached to a bone that moves is called the **insertion**. The point where the muscle is attached to a bone that remains in a fixed position is called the **origin**.

How Muscles Contract

Muscles are believed to contract through a process called the **Sliding Filament Theory**. In this theory, the muscles contract when actin filaments slide over myosin filaments resulting in a shortening of the length of the sarcomeres, and hence, a shortening of the muscle fibers. During this process the actin and myosin filaments do not change length when muscles contract, but instead they slide past each other.

During this process the muscle fiber becomes shorter and fatter in appearance. As a number of muscle fibers shorten at the same time, the whole muscle contracts and causes the tendon to pull on the bone it attaches to. This creates movement that occurs at the point of insertion.

For the muscle to return to normal (i.e., to lengthen), a force must be applied to the muscle to cause the muscle fibers to lengthen. This force can be due to gravity or due to the contraction of an opposing muscle group.

Skeletal muscles contract in response to an electric signal called an **action potential**. Action potentials are conducted along nerve cells before reaching the muscle fibers. The nerve cells regulate the function of skeletal muscles by controlling the number of action potentials that are produced.

The action potentials trigger a series of chemical reactions that result in the contraction of a muscle.

When a nerve impulse stimulates a motor unit within a muscle, all of the muscle fibers controlled by that motor unit will contract. When stimulated, these muscle fibers contract on an all-or-nothing basis. The all-or-nothing principle means that muscle fibers either contract maximally along their length or not at all. Therefore, when stimulated, muscle fibers contract to their maximum level and when not stimulated there is no contraction. In this way, the force generated by a muscle is not regulated by the level of contraction by individual fibers, but rather it is due to the number of muscle fibers that are recruited to contract. This is called muscle fiber recruitment. When lifting a light object, such as a book, only a small number of muscle fibers will be recruited. However, those that are recruited will contract to their maximum level. When lifting a heavier weight, many more muscle fibers will be recruited to contract maximally.

When one muscle contracts, another opposing muscle will relax. In this way, muscles are arranged in pairs. An example is when you bend your arm at the elbow: you contract your bicep muscle and relax your tricep muscle. This is the same for every movement in the body. There will always be one contracting muscle and one relaxing muscle. If you take a moment to think about these simple movements, it will soon become obvious that unless the opposing muscle is relaxed, it will have a negative effect on the force generated by the contracting muscle.

A muscle that contracts, and is the main muscle group responsible for the movement, is called the agonist or prime mover. The muscle that relaxes is called the antagonist. One of the effects that regular strength training has is an improvement in the level of relaxation that occurs in the opposing muscle group. Although the agonist/antagonist relationship changes, depending on which muscle is responsible for the movement, every muscle group has an opposing muscle group.

Smaller muscles may also assist the agonist during a particular movement. The smaller muscle is called the synergist. An example of a synergist would be the deltoid (shoulder) muscle during a press-up. The front of the deltoid provides additional force during the press-up; however, most of the force is applied by the pectoralis major (chest). Other muscle groups may also assist the movement by helping to maintain a fixed posture and prevent unwanted movement. These muscle groups are called fixators. An

example of a fixator is the shoulder muscle during a bicep curl or tricep extension.

Types of Muscular Contraction

- *Isometric*
  - This is a static contraction where the length of the muscle, or the joint angle, does not change. An example is pushing against a stationary object such as a wall. This type of contraction is known to lead to rapid rises in blood pressure.
- *Isotonic*
  - This is a moving contraction, also known as **dynamic contraction**. During this contraction the muscle fattens, and there is movement at the joint.
- *Concentric*
  - This is when the muscle contracts and shortens against a resistance. This may be referred to as the lifting or positive phase. An example would be the lifting phase of the bicep curl.
- *Eccentric*
  - This occurs when the muscle is still contracting and lengthening at the same time. This may be referred to as the lowering or negative phase.

Muscle Fiber Types

Not all muscle fibers are the same. In fact, there are two main types of muscle fiber:

- *Type I*
  - Often called slow-twitch or highly-oxidative muscle fibers
  - Slow-twitch muscle fibers contain more mitochondria, the organelles that produce aerobic energy.
  - They are also smaller, have better blood supply, contract more slowly, and are more fatigue resistant than their fast-twitch brothers.
  - Slow-twitch muscle fibers produce energy, primarily, through aerobic metabolism of fats and carbohydrates.
  - The accelerated rate of aerobic metabolism is enhanced by the large numbers of mitochondria and the enhanced blood supply.

    - They also contain large amounts of myoglobin, a pigment similar to hemoglobin that also stores oxygen.
    - The myoglobin provides an additional store of oxygen for when oxygen supply is limited.
    - This extra oxygen, along with the slow-twitch muscle fibers' slow rate of contraction, increases their endurance capacity and enhances their fatigue resistance.
    - Slow-twitch muscle fibers are recruited during continuous exercise at low to moderate levels.
- *Type II*
    - Often called fast-twitch or low-oxidative muscle fibers
    - These fibers are larger in size, have a decreased blood supply, have smaller mitochondria and less of them, contract more rapidly, and are more adapted to produce energy anaerobically (without the need for oxygen) than slow-twitch muscle fibers.
    - Their reduced rate of blood supply, together with their larger size and fewer mitochondria, makes them less able to produce energy aerobically, and are therefore, not well suited to prolonged exercise.
    - However, their faster rate of contraction, greater levels of glycogen, and ability to produce much greater amounts of energy anaerobically make them much more suited to short bursts of energy.
    - Because of their greater speed of contraction and reduced blood supply, they are far less fatigue resistant than slow-twitch fibers, and they tire quickly during exercise.

The number of slow and fast-twitch fibers contained in the body varies greatly between individuals and is determined by a person's genetics. People who do well at endurance sports tend to have a higher number of slow-twitch fibers, whereas people who are better at sprint events tend to have higher numbers of fast-twitch muscle fibers. Both the slow twitch and fast-twitch fibers can be influenced by training. It is possible through sprint training to improve the power generated by slow twitch fibers, and through endurance training, it is possible to increase the endurance level of fast-twitch fibers. The level of improvement varies, depending on the individual, and training can never make slow-twitch fibers as powerful as fast-twitch, nor can training make fast-twitch fibers as fatigue resistant as slow-twitch fibers.

For more information on muscle physiology, click on the links below:

Skeletal Muscle Physiology

Fast Twitch versus Slow Twitch

Skeletal Muscles

Next>Resistance Training Recommendations

Class 2-3: Muscular Fitness

Resistance Training Recommendations

The following has been excerpted and adapted from [Concepts of Fitness and Wellness, 2nd Edition, Georgia Highlands College (CC BY-NC-SA)]:

Resistance Training Recommendations

- *Perform a minimum of 8 to 10 exercises that train the major muscle groups.*
- Workouts should not be too long. Programs longer than one hour are associated with higher dropout rates.
- Choose more compound, or multi-joint exercises, which involve more muscles with fewer exercises.
- *Perform one set of 8 to 12 repetitions to the point of volitional fatigue for each major movement or body area.*
    - More sets may elicit slightly greater strength gains, but additional improvement is relatively small.
      Perform exercises at least 2 days per week.
- More frequent training may elicit slightly greater strength gains, but additional improvement is relatively small since progress is made during the recuperation between workouts.
- *Adhere as closely as possible to the specific exercise techniques.*
- *Perform exercises through a full range of motion.*
    - Elderly trainees should perform the exercises in the maximum range of motion that does not elicit pain or discomfort.

- *Perform exercises in a controlled manner.*

- *Maintain a normal breathing pattern.*
- *If possible, exercise with a training partner.*
    - Partners can provide feedback, assistance, and motivation.

Exercise Order for Resistance Training

The general guidelines for exercise order when training all major muscle groups in a workout is as follows:

Large muscle group exercises (i.e., squat) should be performed before smaller muscle group exercises (i.e., shoulder press).

- Multiple-joint exercises should be performed before single-joint exercises.

- For power training, total body exercises (from most to least complex) should be performed before basic strength exercises. For example, the most complex exercises are the snatch (because the bar must be moved the greatest distance) and related lifts, followed by cleans and presses. These take precedence over exercises such as the bench press and squat.

- Alternating between upper and lower body exercises or opposing (agonist–antagonist relationship) exercises can allow some muscles to rest while the opposite muscle groups are trained. This sequencing strategy is beneficial for maintaining high training intensities and targeting repetition numbers.

- Some exercises that target different muscle groups can be staggered between sets of other exercises to increase workout efficiency. For example, a trunk exercise can be performed between sets of the bench press. Because different muscle groups are stressed, no additional fatigue would be induced prior to performing the bench press. This is especially effective when long rest intervals are used.[3]

Resistance Training Conclusion

The most effective type of resistance-training routine employs a variety of techniques to create a workout program that is complete and runs the gamut, from basic to specialized. Learning different methods of training, different types of resistance, and the recommended order can help you acquire a balanced, complete physique. That does not mean that these training methods will help everybody to win competitions, but they will help you learn how to tune in to your body and understand its functions through resistance and movement. This knowledge and understanding develops a valuable skill, allowing you to become more adept at finding what works best for you on any given day.

Next>Repetitions and Sets

Class 2-3: Muscular Fitness

Repetitions and Sets

Understanding repetition ranges lets us know how many times to do an exercise to get the benefit we are looking for.

Recall that "stress" is any stimulus that causes a change, and that how "stressful" something is depends on our ability.

With exercise, the specific changes we will see depend on those F.I.T.T. elements and our current level of ability.

The "repetition range" is the number of times we can do an exercise before fatigue, before we *have* to stop.

Choosing the correct repetition range for strength, muscle growth (hypertrophy), or endurance is an important aspect of a realistic approach to exercise.

- 1-3 maximum repetitions before unable to do any more results primarily in POWER improvements.
- 4-8 maximum repetitions before unable to do any more results primarily in STRENGTH improvements.
- 8-12 reps maximum repetitions before unable to do any more results primarily in SIZE improvements.
- 12-20 or more maximum repetitions before unable to do any more results primarily in ENDURANCE improvements.

To Learn More

To learn more about how to set up a muscular fitness plan, the National Strength and Conditioning Association has a comprehensive "Basics of Strength and Conditioning Manual" available for free download.

Next>Self-Talk

How can self-talk help you succeed with your wellness goals?

Class 2-3: Muscular Fitness

Self-Talk

Visit this website on self-scripting from the University of North Carolina at Chapel Hill's Learning Center to learn more about the importance of self-talk.

Next>Summary

Class 2-3: Muscular Fitness

Summary

Major Points

During today's class, you have learned:

- Basic muscle physiology
    - Skeletal muscles are made up of a number of **muscle fibers**.
- Resistance Training Recommendations
    - Perform exercises at least 2 days per week.
    - Perform a minimum of 8 to 10 exercises that train the major muscle groups.
    - Choose more compound, or multi-joint exercises, which involve more muscles with fewer exercises.
    - Perform one set of 8 to 12 repetitions to the point of volitional fatigue for each major movement or body area.
        - More sets may elicit slightly greater strength gains, but additional improvement is relatively small.
    - Progress is made during the recuperation between workouts.
    - Perform exercises through a full range of motion.
    - Perform exercises in a controlled manner.
    - Maintain a normal breathing pattern.
- Exercise Order
    - Large muscle groups and more muscle groups before smaller and fewer ones.
- Choosing the correct repetition range for strength, muscle growth (hypertrophy), or endurance is an important aspect of a realistic approach to exercise.
    - 1-3 maximum repetitions before unable to do any more results primarily in POWER improvements.
    - 4-8 maximum repetitions before unable to do any more results primarily in STRENGTH improvements.
    - 8-12 reps maximum repetitions before unable to do any more results primarily in SIZE improvements.
    - 12-20 or more maximum repetitions before unable to do any more results primarily in ENDURANCE improvements.

- Self-Talk - Internal Dialogue
    - Most helpful when it is positively focused, accurate, and realistic.
    - Unhelpful self-talk tends to be negative, inaccurate, or unrealistic.

Class 2-4: Flexibility

Overview

Today's Class Overview

In today's class, you will learn the importance of flexibility and how to go about stretching effectively.

Today's Class Objectives

By the end of this module you should be able to:

1. Communicate the importance of flexibility as a wellness behavior and as part of a fitness plan.
2. Identify when and how to stretch effectively.
3. Implement flexibility training recommendations.
4. Explain and apply the concept of "self-compassion."

Outline of Today's Class

- Materials
    1. Overview
    2. Review
    3. What is Flexibility?
    4. Joint Structure and Health
    5. Flexibility Training Recommendations
    6. Self-Compassion
    7. Summary

Next>Review

Class 2-4: Flexibility

Review

Reviewing 2-3: Muscular Fitness

- Basic muscle physiology
  - Skeletal muscles are made up of a number of **muscle fibers**.
- Resistance Training Recommendations
  - *Perform a minimum of 8 to 10 exercises that train the major muscle groups.*
  - Choose more compound, or multi-joint exercises, which involve more muscles with fewer exercises.
  - *Perform one set of 8 to 12 repetitions to the point of volitional fatigue for each major movement or body area.*
    - More sets may elicit slightly greater strength gains, but additional improvement is relatively small.
      Perform exercises at least 2 days per week.
  - Progress is made during the recuperation between workouts.
  - *Perform exercises through a full range of motion.*
  - *Perform exercises in a controlled manner.*
  - *Maintain a normal breathing pattern.*
- Exercise Order
  - Large muscle groups and more muscle groups before smaller and fewer ones.
- Choosing the correct repetition range for strength, muscle growth (hypertrophy), or endurance is an important aspect of a realistic approach to exercise.
  - 1-3 maximum repetitions before unable to do any more results primarily in POWER improvements.
  - 4-8 maximum repetitions before unable to do any more results primarily in STRENGTH improvements.
  - 8-12 reps maximum repetitions before unable to do any more results primarily in SIZE improvements.
  - 12-20 or more maximum repetitions before unable to do any more results primarily in ENDURANCE improvements.
- Self-Talk - Internal Dialogue
  - Most helpful when it is positively focused, accurate, and realistic.
  - Unhelpful self-talk tends to be negative, inaccurate, or unrealistic.

Next>What is Flexibility?

Class 2-4: Flexibility

What is Flexibility?

The following has been excerpted and adapted from Concepts of Fitness and Wellness, 2nd Edition, Georgia Highlands College (CC BY-NC-SA):

What is Flexibility?

Flexibility relates to the ability to move a joint through its full range of motion (ROM).

Developing a complete fitness program requires taking time to emphasize this component by stretching.

Unfortunately, as the American Council on Exercise points out, "Most people neglect flexibility training, limiting freedom of movement, physical and mental relaxation, release of muscle tension and soreness, and injury prevention."[1]

Perhaps the reason it is so easy for people to overlook flexibility is because its benefits, while significant, are felt more than seen.

However, failing to address this component of fitness can have serious consequences, especially as a person ages.

Without flexibility, everyday tasks, such as sweeping the floor or even getting out of bed, become difficult. A reduced mobility of joints increases the risk of injury during an exercise routine, as well as the risk of occasional and chronic back pain.

This chapter will provide a greater understanding of this vitally important component of a complete fitness program and demonstrate why flexibility shouldn't be overlooked.

Types of Flexibility

Flexibility is classified into two types: static and dynamic.

- *Static flexibility*
    - This type of flexibility is a measure of the limits of a joint's overall range of motion. It is measured by stretching and holding a joint in the position of its maximum range while using a measuring instrument to quantify that range. To achieve the maximum range, **passive forces**, the force generated from an external source, are required.
- *Dynamic flexibility*
    - This type of flexibility is a measure of overall joint stiffness during movement. Unlike static flexibility, dynamic flexibility requires active force production, or your own muscles contracting. Because quantifying "stiffness," is difficult, dynamic flexibility is measured more subjectively. Assessment is based on how easy or difficult it is to perform certain tasks, such as swinging a tennis racket, climbing steps, or getting in and out of a car.

The aim of any good stretching program is to improve both static and dynamic flexibility so that normal ROM can be achieved. The definition of *normal* in this context is one developed from population studies that measured various areas of the body and established an average degree of movement for a particular joint.

Benefits of Flexibility and Stretching

Regular stretching provides many benefits, the most important of which is simple: flexibility provides freedom of movement and the ability to complete activities with greater ease.

- Healthy Joints and Pain Management
    - As many as 26 percent of all adults report pain and stiffness in joints. That number increases dramatically with age, and women are more likely to develop joint symptoms.
    - For adults, arthritis is one of the most common conditions, with 54% of people 75 years and older having been diagnosed with arthritis.[3] Regular exercise, including regular stretching, is essential for people with arthritis to maintain function and manage joint pain.

    - Even for those not affected by joint conditions, stretching increases joint mobility and function, and decreases joint stiffness and pain.
    - Imbalances in the muscles can cause discomfort and pain. For example, if the front of a person's thighs and hips gets too tight from a lack of flexibility, the tension will pull on the hips, where the muscles are attached. The result is the pelvis may be pulled forward and cause greater sway in your lower back. This affects posture and can eventually lead to pain and stiffness in the neck, shoulders, and lower back.
    - Stretching all major muscle groups and joint areas regularly promotes good alignment and balance.
- Muscle Relaxation and Stress Relief
    - Staying in one position for long periods of time, repetitive movements, and other everyday stressors can result in stiff muscles and knots, also called trigger points.
    - Regular stretching decreases anxiety, blood pressure, and breathing rate, which help to relax muscles and aches and pains related to neuromuscular tension (stress).
    - Flexibility has also been prescribed successfully to treat dysmenorrhea, which is painful menstruation.
    - It also relieves muscle cramps that can occur during exercise or participation in sports.
- Maintaining or Improving Range of Motion
    - For many college students, maintaining long- term flexibility is not a concern. For young adults, bending over to tie their shoes is painless. Walking around campus with a backpack requires minimal effort.
    - However, ROM declines with age. Simple activities like rotating the head and neck to glance over the shoulders, getting in and out of a vehicle, or carrying groceries can become painful.
    - Therefore, flexibility is critical in maintaining a high quality of life throughout the aging process.
- Other Benefits
    - In addition to the benefits listed above, research has documented additional benefits that provide good reasons for maintaining a routine of stretching:
        - *Increased blood flow*
            - Blood carries vital nutrients and oxygen to muscles and tissues. Stretching increases blood

flow to the muscles being stretched, which helps them recover from exercise faster.

- *Reduced risk of developing future lower back pain*
  - Although research is still inconclusive, most experts agree that muscle fitness and stretching exercises reduce the risk of developing lower back pain by counteracting the natural loss in muscle and connective tissue elasticity that occurs with aging.

Improving Range of Motion

Joint ROM results from a combination of factors, which are classified as either internal or external. Internal structures relate to the physical structures of body materials and tissue. External factors are non-structural and include gender, age, excess fat mass, muscle mass, environmental temperature, and restrictions in clothing or equipment.

Internal factors include joint structure/joint mechanics and the connective and soft tissue surrounding the joint. Because muscular actions, such as muscular contractions and stretching, are controlled by the nervous system, another internal factor can be attributed to the neuromuscular system and how the stretching and tension is managed.

Next>Joint Structure and Health

Class 2-4: Flexibility

Joint Structure and Health

The following has been excerpted and adapted from Concepts of Fitness and Wellness, 2nd Edition, Georgia Highlands College(CC BY-NC-SA):

Joint Structure

A joint is defined as a location on the skeletal system where two or more bones intersect and interact. For example, the humerus (upper arm) intersects with the radius and ulna (lower arm) at the point of the elbow. The bony formation of each joint structurally limits its ROM. For example, the shoulder joint, which is structurally a ball-in-socket joint, can rotate in multiple directions, giving it a wide range of motion. However, the knee joint is a modified hinge joint, which is limited to essentially a forward-backward direction of movement.

Additionally, ROM may be limited by excessive fat mass or even large muscle mass surrounding a particular joint. Although the amount of muscle mass and fat mass surrounding a joint can be altered by diet and activity levels, joint structure is permanent. As a result, little can be done to improve flexibility in this area.

Not only is range of motion related to the joint structure, but flexibility exercises are joint-specific.

Stretching the hamstring will not improve flexibility in the shoulders. Likewise, flexibility in the shoulders may be excellent while fingers or ankles remain “stiff.” As such, a complete and effective stretching program includes multiple stretches for various joints.

Connective and Muscle Tissue

Joints are surrounded and connected by muscles, tendons, ligaments, and skin. The head of the humerus fits into a small cavity to create the shoulder joint. However, those bones cannot remain in that position

without the muscles, tendons, and ligaments that keep the joint tight and hold it in place. In addition, muscle tissue is surrounded with connective tissue, primarily collagen and elastin. As a joint moves through its normal range of motion, all of this soft tissue must stretch to accommodate the movement. Therefore, static and dynamic flexibility is probably most limited by the flexibility of the surrounding soft tissue, specifically the connective tissue.

While the exact biomechanics of how flexibility is changed is not well understood, they do appear to be related to the elastic and plastic properties of the connective tissue. **Elasticity** is defined as the ability to return to resting length after **passive stretching** (i.e., elastic recoil). Like a spring, soft tissues stretch and then recoil to their resting position. **Plasticity** is the tendency to assume a greater length after passive stretching (i.e., plastic deformation). Stretching that spring composed of soft tissues will change its resting position to a new longer length. The goal of a flexibility program is to repeatedly overload the elastic properties of the muscle to elicit plastic deformation over time. Experts suggest that a slow, sustained stretch for 30–90 seconds is necessary to produce chronic plastic deformation.

Neuromuscular System

Modern cars come equipped with a central computer and sensors to troubleshoot problems with the vehicle. Sensors in the engine monitor temperature. Sensors on the wheels gauge tire pressure while sensors in the gas tank alert the driver when fuel is low. Much like a car, our bodies are equipped with sensors, called **proprioceptors**, that help us manage movement and prevent injury.

Muscles have two specific types of proprioceptors that determine the length and tension of the muscle. These proprioceptors are called muscle spindles and Golgi tendon organs (GTOs).

Muscles spindles lie parallel to the regular muscle and help determine the length of muscles when they are being stretched. When a muscle is stretched, it sends signals to the central nervous system causing the stretched muscle to contract. This resistance to the stretch, called the

myotatic or **stretch reflex** is generated by the nervous system's reflexive stimulus sent to the stretching muscle. That same signal also causes the antagonist, or opposing muscle to relax, called **reciprocal inhibition**. As such, when the upper thigh (quadriceps) are stretched, the hamstrings (antagonist to the quadriceps) relax.

The GTOs are located near the **musculotendon junction**, the end points of the muscle, and relay messages to the central nervous system regarding muscle lengthening and tension of the muscle. When activated, these signals will override the stretch reflex causing a sudden relaxation of the stretching muscle. This is called **autogenic inhibition** or the **inverse myotatic reflex**. This inhibitory reflex can only occur after the muscle has been stretched for 5 seconds or longer. This is why, to effectively stretch, movements must be sustained for long, slow increments of time. Otherwise, the resistance encountered from the stretch reflex will not be overridden and lengthening cannot occur. Whether signaling the muscles to contract or relax, the neuromuscular system manipulates the stretched muscle, presumably as a protective mechanism to prevent injury.

Next>Flexibility Training Recommendations

Class 2-4: Flexibility

Flexibility Training Recommendations

The following has been excerpted and adapted from [Concepts of Fitness and Wellness, 2nd Edition, Georgia Highlands College (CC BY-NC-SA)]:

Improving Flexibility

Research has identified multiple stretching techniques that aid in improving ROM. Regardless of the specific technique or specific mode used, each technique can be performed using either active or passive mode.

Active stretching, also called unassisted stretching, is done individually without an external stimulus.

Passive stretching, or assisted stretching, is when a partner or trainer is used as the stimulus in the stretching exercise.

Both modes are effective and can be applied to each of the techniques described below.

Static Stretching

The technique most commonly prescribed and used to improve flexibility is the static stretch. A static stretch involves slow, gradual, and controlled movements. The muscle group is stretched toward the end of the joint's ROM until the point of mild discomfort is reached. Once that point is reached, the stretch is held in a "static" position for 30 to 90 seconds. After the prescribed time, the stretch can be repeated. Common ways in which static stretching is applied would be performing Yoga routines or stretching after a workout or an athletic event. Some of the major advantages of static stretching are as follows: 1) It is generally considered safe (see Stretches to Avoid); 2) It is simple to perform; and 3) It is effective at increasing ROM. The only major disadvantage comes from doing it too much, which can reduce strength and may make joints unstable. Of course, this potential risk applies to all of the techniques.

Ballistic Stretching

Ballistic stretching involves forceful bouncing or ball-like movements that quickly exaggerate the joint's ROM without holding the position for any particular duration. This type of stretching involves dynamic movements like those done by athletes during sports events. In that regard, ballistic stretching is seen as being very specific to and beneficial for athletes. However, one criticism of ballistic stretching is that because of the short duration of the stretch and the forceful nature of ballistic movements, the muscular contraction from the stretch reflex may cause muscle soreness or even injury. For that reason, many coaches regard ballistic stretching as unsafe. Also, many researchers contend that it is less effective at improving ROM. Nonetheless, the American College of Sports Medicine (ACSM) still recommends ballistic stretching as one method to effectively increase flexibility.

Dynamic Stretching

Ballistic stretching is a form of dynamic stretching. However, when referring to dynamic stretching routines, most fitness professionals are referring to dynamic movements that do not involve forceful bouncing motions.

Instead, dynamic stretching, in this context, suggests performing exaggerated sports movements in a slower, more controlled manner. For example, a sprinter may use several exaggerated stride lengths before a race to improve hip ROM.

This type of stretching is useful for warming up before activity, since it causes an increase in the flow of blood throughout the body and increases body temperature.

An advantage of dynamic stretching is its ability to target and improve dynamic flexibility, which in turn may improve performance. A disadvantage comes from the movements involved, which often require good balance and coordination. Since mastering the correct form requires time and a certain level of athleticism, dynamic stretching may not be suitable for certain populations.

Proprioceptive Neuromuscular Facilitation (PNF) Stretching

This type of exercise usually involves a partner. The partner will passively stretch the person's muscle. This movement is immediately followed by an isometric muscle contraction against resistance. This contraction is then followed by another passive stretch. This type of stretch is also named contract-relax stretch because of the sequence of movements involved. Other types of PNF stretching involve contract-relax-antagonist contraction, also describing the sequence of movements involved but adding an additional step.

As the name of the technique implies, PNF stretching emphasizes the natural interaction of the proprioceptors with the muscles to increase the ROM during the stretch. Remember that during the stretch, the muscle spindles cause two responses: the stretch reflex and the reciprocal inhibition (the relaxing of the antagonist muscle). After 5 seconds, the GTOs then override the muscle spindle's signals causing autogenic inhibition. Because the muscle is relaxed, it can be stretched more easily. To reiterate, the stretch either uses the activity of the antagonist muscle to get the target muscle to relax or the target muscle itself relaxes as a result of the contraction of the antagonist muscle.

While many experts assert that PNF stretching is the most effective technique, studies that compare static and PNF stretching are inconclusive. Regardless, it does appear to be very effective at increasing static flexibility. Some disadvantages to PNF are that it generally requires a knowledgeable partner, it is somewhat complicated, and it can cause soreness as a result of the contractions.

Applying the FITT Principle

As mentioned previously, the ACSM has made recommendations for designing a flexibility program based on the FITT Principle (**F**requency, **I**ntensity, **T**ime and **T**ype).

The American College of Sports Medicine recommends, your flexibility program should include multiple stretching exercises that target all major joints, including the neck, shoulders, elbows, wrists, trunk, hips, knees, and ankles.

Note: You will learn more about selecting exercises in today's activity.

After selecting your exercises, follow the recommendations below when performing your routine:

- *Frequency*
  Stretch a minimum of 2-3 days per week, ideally 5-7 days per week.
- *Intensity*
  Stretch to the point of tightness or mild discomfort.
- *Time (duration of each stretch)*
  Stretch for a minimum of 10 seconds for very tight muscles with an emphasis on progressing to 30-90 seconds. Complete two to four repetitions of each stretch.
- *Type (mode)*
  Select the technique that best suits your circumstances: static, dynamic, ballistic, or proprioceptive neuromuscular facilitation.

When to Stretch

Although stretching can be done any time, the ACSM traditionally recommends that flexibility training be incorporated into the warm up or cool down phase of an exercise session.

Recent studies suggests that static stretching before an exercise session will compromise the force-producing capabilities of muscles and should be avoided.

Therefore, it is recommended that static stretching be restricted to *after* the warm-up or workout, when the temperature of the body and muscles has increased.

Conversely, dynamic stretching may improve performance by 'priming' the nervous system, increasing body temperature, and increasing blood flow.

Stretching Safely

In addition to warming up your muscles before performing stretching exercises, additional precautions can be taken to ensure the safety of your routine.

When muscles are stretched quickly and forcefully, the stretch reflex can be activated.

This creates significant tension because the muscle fibers will not only be stretching but also attempting to contract.

As mentioned previously, this is one of the reasons ballistic stretching may not be suitable for everyone.

To avoid this, stretch slowly and in a controlled fashion while holding the stretch for 10 seconds or more.

Next>Self-Compassion

Class 2-4: Flexibility

Self-Compassion

Read the article "Want to change your life? Try self-compassion" by Shauna Shapiro and the Greater Good Institute at UC Berkeley.

Next>Summary

Class 2-4: Flexibility

Summary

Major Points

During today's class, you have learned:

- Flexibility
  - Ability to move a joint through full ROM
  - Static vs Dynamic
- Benefits of Flexibility and Stretching
  - Healthy Joints and Pain Management
  - Muscle Relaxation and Stress Relief
  - Maintaining or Improving ROM
- Proprioceptors - Sensors within muscles
- Types of Stretching
  - Static - Best performed after a workout when the body is warm.
  - Ballistic - Used less commonly, primarily by those in specific activities like dancing.
  - Dynamic - Best performed before a workout as part of a warm-up.
  - PNF - Advanced technique that uses knowledge of the sensors within muscles to relax them by tightening and then relaxing.
- Recommendations
  - *Frequency*
    Stretch a minimum of 2-3 days per week, ideally 5-7 days per week.
  - *Intensity*
    Stretch to the point of tightness or mild discomfort.
  - *Time (duration of each stretch)*
    Stretch for a minimum of 10 seconds for very tight muscles with an emphasis on progressing to 30-90 seconds. Complete two to four repetitions of each stretch.
  - *Type (mode)*
    Select the technique that best suits your circumstances: static, dynamic, ballistic, or proprioceptive neuromuscular facilitation.
- Self-compassion—bringing kindness and care to our own suffering.

Class 3-1: Eating for Wellness

Overview

Today's Class Overview

In today's class, you will begin exploring nutrition as a foundation for wellness.

Today's Class Objectives

By the end of this module you should be able to:

1. Contextualize food as fuel for daily activity.
2. Identify macronutrients, micronutrients, and the importance of eating well.
3. Find and use resources for further information on nutrition and eating.
4. Apply the concept of mindfulness to eating and strategize ways to eat mindfully.
5. Define and apply the glycemic index.
6. Reflect on your personal relationship to eating.

Outline of Today's Class

- Materials
    1. Overview
    2. Review
    3. Fueling Our Bodies Properly
    4. Nutrients
    5. Healthy Eating
    6. Practicing Mindful Eating
    7. Resources for Healthy Eating
    8. Summary

Next>Review

Class 3-1: Eating for Wellness

Review

As you prepare to move into this final portion of the course, take a moment to recall these major concepts and keep them in mind as you continue in the course.

- Hierarchy of Needs
- Seven Dimensions of Wellness
- Metacognition
- Cognitive Biases
- Emotional Intelligence
- Stress Management
- Mindfulness
- Healthy Relationships
- Sleep
- The Physical Built Environment
- Social Determinants of Health
- The "Health Gradient"
- Health Literacy
- Mental Health
- The Built Environment of Attention
- Psuedoinformation
- Media Literacy
- Physical Activity
- Exercise
- Transtheoretical Model of Change
- S.M.A.R.T.
- Seven Principles of Adaptation for Exercise Planning
- F.I.T.T.
- Heart Disease and Cardiovascular Health
- Exposure to Nature
- Muscular Fitness
- Self-Talk
- Flexibility
- Self-Compassion

Next>Fueling Our Bodies Properly

Class 3-1: Eating for Wellness

Fueling Our Bodies Properly

The following has been excerpted and adapted from "Human Biology Butte 17-18" by CK-12 licensed CC BY-NC 3.0:

Fueling Our Bodies Properly

Case Study: What's Wrong with Fast Food?

Like many Americans, 20-year-old Kevin eats fast food several times a week. After a long day of classes and work, it's easy for him to pick up fast food for dinner from a drive-through window on his way home. He also often has fast food for lunch on his short break. He knows that fast food probably isn't the healthiest choice, but it is convenient and he enjoys it. Besides, he's young and only slightly overweight, with no major health problems, so he's not too concerned about it affecting his health.

One day, Kevin gives his friend Carlos a ride home, and suggests they pick up some fast food on the way. Carlos says, "Nah, I don't eat that stuff very often. It's not good for you." Kevin feels a little defensive and asks Carlos what exactly is wrong with it. Carlos says, "Well, it has a lot of calories and it's not exactly fresh food." Kevin says he doesn't think it has any more calories than other types of meals, and he eats some fresh fruit and vegetables at other times — is it really that bad for his health to eat fast food five or six times a week?

Carlos thinks about this. He has heard many times that fast food is not good for your health, but he's not sure of the exact reasons. When he gets home, he decides to do some research. He visits the website of Kevin's favorite fast food restaurant and looks up the nutritional information for his typical meal of a cheeseburger, large fries, and a large soda. Some of the information he found is shown in the tables below.

Nutritional Information for a Typical Fast Food Meal

Food	Calories	Total Fat (%DV)	Saturated Fat (%DV)	Trans Fat	Carbohydrates (%DV)

Burger	540	43%	49%	1 g	15%
Fries	510	37%	17%	0 g	22%
Soda	300	0%	0%	0 g	27%
Total	**1,350**	**80%**	**66%**	**1 g**	**64%**

Food	**Sodium (%DV)**	**Iron (%DV)**	**Vitamin A (%DV)**	**Vitamin C (%DV)**	**Calcium (%DV)**
Burger	40%	25%	10%	2%	15%
Fries	15%	6%	0%	30%	2%
Soda	1%	0%	0%	0%	0%
Total	**56%**	**31%**	**10%**	**32%**	**17%**

% DV = percentage of adult recommended daily value (DV) for each nutrient.

What does this nutritional information mean? How can it help Carlos understand the potential health impact of Kevin frequently eating meals like this? As you read this chapter, you will learn about the nutrients your body needs to function and stay healthy, and how eating too much or too little of certain nutrients can wreak havoc on your health. You will learn how to interpret the tables above, and will better understand the health consequences of a diet that is heavy in typical fast food items. At the end of the chapter, you will learn why eating this meal frequently is not the best choice for Kevin's health, and how he — and you — can make better food choices.

Chapter Overview: Nutrition

In this chapter, you will learn about nutrients, proper nutrition, and the negative health consequences of bad nutrition and improperly prepared food. Specifically, you will learn about:

- The six major classes of nutrients — carbohydrates, proteins, lipids, water, vitamins, and minerals — which are substances the body needs for energy, building materials, and body processes.
- Essential nutrients, which must be obtained from food, and

nonessential nutrients, which can be synthesized by the body.

- Macronutrients, which the body needs in relatively large quantities, and micronutrients, which the body needs in relatively small quantities.
- The functions of specific nutrients in the body and sources of these nutrients.
- Phytochemicals and their potential role in maintaining normal body functions and good health.
- Guidelines for healthy eating and good nutrition, and why a healthy diet can reduce the risk of many diseases.
- Energy homeostasis, which is the balance between calories consumed and those that are used by the body.
- Types of malnutrition, including undernutrition, overnutrition, and unbalanced nutrition.
- Nutrient and energy density and how knowledge of these factors can be used to make healthier food choices.
- How appetite is regulated.
- Eating disorders including anorexia nervosa, bulimia nervosa, and binge eating disorder and their causes, health effects, and treatments.
- Obesity and how it is defined, its causes, health consequences, ways to prevent and treat it, and the impact on public health.
- Undernutrition and how it is defined, its causes, specific undernutrition syndromes, and the often irreversible effects on children.
- The impact of undernutrition around the world, including richer nations, and public health approaches to treat and prevent undernutrition.

As you read this chapter, think about the following questions related to the tables above that contain nutritional information for Kevin's typical fast food meal:

1. Which nutrients might Kevin consume too much of if he eats meals like this frequently? Why would these nutrients be a concern? What health issues could consuming them in excess cause?

2. Which nutrients might Kevin not get enough of if he eats meals like this frequently? What health issues could this cause?

3. What are some ways Kevin can make better food choices, even at a fast food restaurant? Why would these choices improve his diet and health?

Next>Nutrients

Class 3-1: Eating for Wellness

Nutrients

The following has been excerpted and adapted from "Human Biology Butte 17-18" by CK-12 licensed CC BY-NC 3.0:

Nutrients

Nutrients are substances the body needs for energy, building materials, and control of body processes. There are six major classes of nutrients based on biochemical properties: carbohydrates, proteins, lipids, water, vitamins, and minerals. Fiber, which consists largely of nondigestible carbohydrates, is sometimes added as a seventh class of nutrients.

Besides the biochemical classification of nutrients, nutrients are also categorized as either essential or nonessential nutrients. **Essential nutrients** cannot be synthesized by the human body, at least not in sufficient amounts for normal functioning, so these nutrients must be obtained from food. **Nonessential nutrients,** in contrast, can be synthesized in the body in sufficient quantities for normal functioning, although they are generally obtained from food as well. Except for dietary fiber, all dietary carbohydrates are considered nonessential. Every other major class of nutrients contains multiple essential compounds. For example, there are nine essential amino acids, at least two essential fatty acids, and many essential vitamins and minerals. Water and fiber are also essential nutrients.

The major classes of nutrients are also categorized as macronutrients or micronutrients depending on how much of them the body needs.

Macronutrients

Macronutrients are nutrients that the body needs in relatively large amounts. They include carbohydrates, proteins, lipids, and water. All macronutrients except water are used by the body for energy, although this is not their sole physiological function. The energy provided by macronutrients in food is measured in kilocalories, commonly called **Calories,** where 1 Calorie is the amount of energy needed to raise 1 kilogram of water by 1 degree C.

Carbohydrates

Carbohydrates are organic compounds made up of simple sugars (as in the cotton candy pictured below). Carbohydrates are classified by the number of sugars they contain as monosaccharides (one sugar), such as glucose and fructose; disaccharides (two sugars), such as sucrose and lactose; and polysaccharides (three or more sugars), including starch, glycogen, and cellulose (the main component of dietary fiber). Dietary carbohydrates come mainly from grains, fruits, and vegetables. All digestible carbohydrates in the diet are used by the body for energy. One gram of dietary carbohydrates provides 4 Calories of energy.

Fiber

Fiber, such as the cellulose in plant foods, cannot be digested by the human digestive system, so most of it just passes through the digestive tract. Although it does not provide energy as other carbohydrates do, it is nonetheless considered an essential nutrient for its physiological roles. There are two types of fiber in many plant foods: soluble fiber and insoluble fiber.

- Soluble fiber consists of nondigestible complex plant carbohydrates that dissolve in water, forming a gel. This type of dietary fiber thickens and slows the movement of chyme through the small intestine and thereby slows the absorption of glucose into the blood. This may lessen insulin spikes and the risk of type 2 diabetes. Soluble fiber can also help lower blood cholesterol. Good dietary sources of soluble fiber include oats, apples, and beans.
- Insoluble fiber consists mainly of cellulose and does not dissolve in water. As insoluble fiber moves through the large intestine, it stimulates peristalsis. This keeps food wastes moving and helps prevent constipation. Insoluble fiber in the diet may also lessen the risk of colon cancer. Good dietary sources of insoluble fiber include cabbage, bell peppers, and grapes.

Proteins

Proteins are organic compounds made up of amino acids. You may think of meat and fish as major sources of dietary proteins — and they are — but there are many good plant sources as well, including soybeans (see the figure below) and other legumes. Proteins in food are broken down during digestion to provide the amino acids needed for protein synthesis. Proteins

in the human body are the basis of many body structures, including muscles and skin. Proteins also function as enzymes that catalyze biochemical reactions, hormones that regulate body functions in other ways, and antibodies that help fight pathogens. Any amino acids from food that are not needed for these purposes are excreted in urine, converted to glucose for energy, or stored as fat. One gram of protein provides 4 Calories of energy.

The most important aspect of protein structure from a nutritional standpoint is amino acid composition. About 20 amino acids are commonly found in the human body, of which about 11 are nonessential because they can be synthesized internally. The other 9 amino acids are essential amino acids that must be obtained from dietary sources. Essential amino acids are phenylalanine, valine, threonine, tryptophan, methionine, leucine, isoleucine, lysine, and histidine. Animal proteins such as meat and fish are concentrated sources of all 9 essential amino acids, whereas plant proteins may have only trace amounts of one or more essential amino acids.

Lipids

Lipids, commonly called fats, are organic compounds made up mainly of fatty acids. Fats in foods (such as those pictured below), as well as fats in the human body, are typically triglycerides (three fatty acids attached to a molecule of glycerol). Fats provide the body with energy and serve other vital functions, including helping to make and maintain cell membranes and functioning as hormones. When used for energy, one gram of fat provides 9 Calories of energy.

Saturated vs Unsaturated Fats

Fats are classified as either saturated or unsaturated depending on the type of bonds in their fatty acids.

- In saturated fats, carbon atoms share only single bonds, so each carbon atom is bonded to as many hydrogen atoms as possible. Saturated fats tend to be solids at room temperature.
    - Most saturated fat in the diet comes from animal foods, such as meat and butter.
- In unsaturated fats, at least one pair of carbon atoms share a double bond, so these carbon atoms are not bonded to as many hydrogen atoms as possible. Unsaturated fats with just one double bond are

called monounsaturated fats. Those with multiple double bonds are called polyunsaturated fats. Unsaturated fats tend to be liquids at room temperature.
    - Unsaturated fats in the diet come mainly from certain fish such as salmon and from plant foods such as seeds and nuts.

Essential Fatty Acids

Most fatty acids are not essential. The body can make them as needed, generally from other fatty acids, although this takes energy. Only two fatty acids are known to be essential, called omega-3 and omega-6 fatty acids. They cannot be synthesized in the body, so they must be obtained from food. The most commonly used cooking oils in processed foods are rich in omega-6 fatty acids, so most people get plenty of these fatty acids in their diet. Omega-3 fatty acids are not as prevalent in foods, and most people do not get enough of them in food. Good food sources of omega-3 fatty acids include oily fish such as salmon, walnuts, and flax seeds.

Trans Fats

Trans fats are unsaturated fats that contain types of bonds that are rare in nature. Trans fats are typically created in an industrial process called partial hydrogenation. They may be used in a variety of processed foods (such as those shown in the photo below) because they tend to have a longer shelf life without going rancid. Trans fats are known to be detrimental to human health.

Water

Water is essential to life because biochemical reactions take place in water. Water is continuously lost from the body in multiple ways, including in urine and feces, during sweating, and as water vapor in exhaled breath. This constant loss of water makes water an essential nutrient that must be replenished often.

Too little water is called dehydration. It can cause weakness, dizziness, and heart palpitations. Severe dehydration can lead to death. It is easy to become dehydrated in hot weather, especially when exercising. It is more difficult to consume too much water, but overhydration is also possible. It can result in water intoxication, a serious and potentially fatal condition.

Micronutrients

Micronutrients are nutrients the body needs in relatively small amounts. Micronutrients do not provide energy. Instead, they are necessary for the biochemical reactions of metabolism, among other vital functions. They include vitamins, minerals, and possibly phytochemicals as well.

Vitamins

Vitamins are organic compounds that generally function as coenzymes. A coenzyme is a "helper" molecule that is required for a protein enzyme to work. In this capacity, vitamins play many roles in good health, ranging from maintaining normal vision (vitamin A) to helping blood to clot (vitamin K). Some functions of these and several other vitamins are listed in the table below. Most vitamins are essential nutrients and must be obtained from food. Fruits, vegetables, meat, and fish are all high in one or more essential vitamins. There are only a few nonessential vitamins. Vitamins B_7 and K are produced by bacteria in the large intestine, and vitamin D is synthesized in the skin when it is exposed to UV light.

Selected Vitamins and Some of Their Functions

Vitamin	Function
A	normal vision
B_1 (thiamin)	production of cellular energy from food
B_3(niacin)	cardiovascular health
B_7 (biotin)	support of carbohydrate, protein, and fat metabolism
B_9 (folic acid)	fetal health and development
B_{12}	normal nerve function and production of red blood cells
C	making connective tissue
D	healthy bones and teeth
E	normal cell membranes

K	blood clotting

Minerals

Minerals are inorganic chemical elements that are necessary for normal body processes and good health. Because they are inorganic and not synthesized biologically, all nutrient minerals are considered essential nutrients.

Several minerals are needed in relatively large quantities (> 150 mg/day), so they are sometimes referred to as macrominerals or bulk minerals. They include:

- calcium, which is needed for bone strength, neutralizing acidity in the digestive tract, and nerve and cell membrane functions. Dairy products are good sources of calcium.
- magnesium, which is needed for strong bones, maintaining pH, processing ATP, and other functions. Green leafy vegetables, bran, and almonds are high in magnesium.
- phosphorus, which is needed for bone strength, energy processing, pH regulation, and phospholipids in cell membranes. Milk and meat are good sources of phosphorus.
- sodium, which is needed to regulate blood volume, blood pressure, water balance, and pH. Most processed foods have added sodium. A salt shaker is another common source of sodium.
- chloride, which is needed for the production of hydrochloric acid in the stomach and for cell membrane transport. Chloride in table salt and added to processed foods provides plenty of chloride in most diets.
- potassium, which is needed for proper functioning of the heart and nerves, water balance, and pH. Many fruits and vegetables are high in potassium.
- sulfur, which is needed for the synthesis of many proteins. Meat and fish are good sources of sulfur.

Other minerals are needed in much smaller quantities (≤150 mg/day), so they are often referred to as trace minerals. The table below lists several trace minerals and some of their functions. Good dietary sources of trace minerals include whole grains, seafood, fruits, vegetables, nuts, and legumes.

Selected Trace Minerals and Some of Their Functions

Trace Mineral	Function
Cobalt	synthesis of vitamin B_{12} by gut bacteria
Copper	component of many enzymes
Chromium	metabolism of sugar
Iodine	synthesis of thyroid hormones
Iron	component of hemoglobin and many enzymes
Manganese	processing of oxygen
Molybdenum	component of several enzymes
Selenium	component of oxidases (antioxidants)
Zinc	component of several enzymes

Phytochemicals

The naturally occurring, disease- and pest-fighting plant chemicals known as **phytochemicals** are commonly consumed in plant foods, particularly fresh vegetables and fruits. Besides fighting attacks on plants, many phytochemicals give plants their distinctive colors and characteristic flavors and aromas. Phytochemicals are the reason that blueberries are blue (see photo below), for example, and that garlic has its characteristically strong, pungent taste and smell. There are known to be as many as 4,000 different phytochemicals in plants. Preliminary evidence suggests that certain phytochemicals in the diet help protect human health. For example, some phytochemicals may act as antioxidants that counter cancer-causing free radicals. Research on phytochemicals is still relatively young, so time will tell whether they will eventually be classified as micronutrients.

Next>Healthy Eating

Class 3-1: Eating for Wellness

Healthy Eating

The following has been excerpted and adapted from "Human Biology Butte 17-18" by CK-12 licensed CC BY-NC 3.0:

Healthy Eating

Balancing Act

If you practice yoga, then you know that yoga positions such as the headstand demonstrated here can help you develop good balance. Having good balance, in turn, can reduce your risk of falls and injuries. Another kind of balance is important to ensure that you have good health and prevent disease, and that kind of balance is balance in your diet. Achieving dietary balance requires healthy eating.

Benefits of Healthy Eating

It sounds like something a snake-oil salesman would say, but it's true: healthy eating is a panacea for many human ailments. A healthy diet reduces risk of obesity, cardiovascular disease, type 2 diabetes, osteoporosis, and cancer. Not surprisingly, it also extends the length of life. In fact, an unhealthy diet is one of the leading preventable causes of death. A healthy diet also has mental health benefits. It may stall or reduce the risk of dementia and have a positive effect on memory.

Diet and Nutrition

If you adopt healthy eating habits and get enough exercise, you are likely to have good nutrition. **Nutrition** is the process of taking in nutrients in food and using them for growth, metabolism, and repair. Good nutrition requires eating foods rich in nutrients with the right amount of food energy (Calories) to balance energy use.

Nutrient Balance and Nutrient Density

Eating a wide range of foods, especially fruits and vegetables, is the basis of healthy eating. This helps ensure that you are eating a wide range of

nutrients. However, there is only a limited amount of food you can eat in a single day without consuming too many Calories. In order to maximize the amount of nutrients you take in, you need to spend your "Calorie budget" wisely by choosing foods that have high **nutrient density.** Nutrient density refers to how much of a given nutrient is provided by a particular food, relative to the mass of the food or the amount of Calories it provides. Consider vitamin K as an example. The recommended daily value of vitamin K for adults is 90 µg. Both kale and iceberg lettuce provide vitamin K. A cup of iceberg lettuce provides about 50 µg vitamin K; a cup of kale provides more than 1000 µg of vitamin K. Therefore, kale has about 20 times the nutrient density for vitamin K as lettuce.

Energy Homeostasis and Energy Density

Good nutrition also requires achieving energy homeostasis. **Energy homeostasis** is a balance between the energy consumed in food and the energy expended in metabolism and physical activity. If more energy is taken in as food than is used for metabolism and activity, then the extra energy is stored as fat. An extra 3,500 Calories of food energy results in the storage of almost half a kilogram (1 lb) of body fat. If less energy is taken in than is used, then stored fat may be used for energy. The human brain, particularly the hypothalamus, plays a central role in regulating energy homeostasis. Based on biochemical signals from the body, the hypothalamus generates a sense of hunger or satiation as needed to maintain energy balance.

Energy homeostasis depends on more than hunger and satiation. It also depends on dietary choices, eating habits, and activity levels. To achieve energy balance, it is important to consider the energy density of food. **Energy density** refers to the amount of Calories a food provides per gram (or ounce). Foods high in carbohydrates or proteins are generally less energy dense than foods high in lipids. Carbohydrates and proteins provide 4 Calories of energy per gram, whereas lipids provide 9 Calories of energy per gram. However, within nutrient classes, there is considerable variation in the energy density of foods. For example, fruits are high in carbohydrates that the body uses for energy. Both casaba melons and figs are fruits and provide energy, but an ounce of casaba melon provides only about 8 Calories of energy, whereas an ounce of figs provides about 80 Calories of energy. This means that figs have 10 times the energy density of casaba melons.

Malnutrition

Bad nutrition is referred to as **malnutrition.** The word malnutrition may make you think of starving children in Africa who do not have enough food to eat. This type of malnutrition is called undernutrition, and it is the major nutritional problem in developing countries. Undernutrition is typically caused by inadequate energy intake, often coupled with frequent bouts of infectious disease. It usually results in people being underweight for their height, and it commonly leads to growth failure in children.

Undernutrition is just one type of malnutrition. Excessive food intake can also cause malnutrition, in this case, overnutrition. This is the major nutritional problem in developed countries. Overnutrition is typically caused by excessive energy intake coupled with inadequate energy expenditure in physical activity. Overnutrition usually leads to people becoming overweight or obese (see the photo below). Obesity is associated with a host of health problems and diseases, including metabolic syndrome, cardiovascular disease, type 2 diabetes, and some types of cancer, among others.

[Figure 3]

Figure: These women are malnourished because they consume more food energy than they expend, resulting in obesity.

Unbalanced nutrition is another type of malnutrition. In this case, the diet contains too much or not enough of specific nutrients other than energy. This type of malnutrition often occurs with undernutrition. However, a person doesn't have to be undernourished to lack specific nutrients. People with adequate food intake and even people with overnutrition may have unbalanced nutrition. Getting either too much or not enough of particular nutrients may cause diseases or other health problems. For example, inadequate vitamin A intake may cause blindness, whereas too much vitamin A can be toxic. Likewise, dietary calcium deficiency may contribute to osteoporosis, whereas too much calcium can cause kidney stones.

Nutrient Needs

The goal of healthy eating is to take in the proper amount of each nutrient to meet nutrient and energy needs. The FDA identifies the recommended adult daily values (DV) for a wide variety of nutrients, based on a 2,000

Calorie daily diet. The values in the table are average values. The exact amount of each nutrient that a given individual needs may differ, depending on such factors as age and gender. Different stages of adulthood have different nutrient needs for several nutrients, and males have somewhat higher needs for many nutrients than do females at most ages, mainly because of gender differences in body size. Other factors that influence individual nutrient needs include health status and activity level. People in poor health may need some nutrients in greater quantities. People who are very active need to obtain more energy from macronutrients in their diet.

Tips for Healthy Eating

The following tips can help you attain energy homeostasis while meeting your nutrient needs.

- Eat several smaller meals throughout the day rather than a few larger meals. Eating more frequently keeps energy, blood glucose, and insulin levels stable.
- Make healthy food choices. Try to eat whole foods rather than processed foods. Whole foods have more nutrients than processed foods. Raw foods also generally retain more nutrients than cooked foods. Overall, try to eat more plant foods and less animal foods.
- Make healthy grain choices. Try to make at least half your grains whole grains. Choose food items with whole grains listed as a main ingredient. Avoid foods that contain mainly or only processed grains, such as white flour or white rice. Include a variety of grains, such as rice, oats, and wheat.
- Make healthy fruit and vegetable choices. Include a variety of green, yellow, red, and orange fruits and vegetables, like those pictured below. These foods are high in vitamins and phytochemicals. Consume whole fruits instead of juices. Whole fruits are higher in fiber and more filling and may also have less sugar. The highest fiber fruits include plums and prunes.
- Combine amino acids in plant foods. The right combinations, such as beans and rice, make complete proteins with all nine essential amino acids. The two foods do not have to be eaten at the same meal to be used together by the body.
- Limit sugar and salt intake. Fresh foods generally have less of these two nutrients than processed foods. For packaged foods, read nutrition facts labels and choose options that are lower in sodium and sugars. Keep in mind that sugar may come in many forms,

including high fructose corn syrup. Put away the salt shaker and sugar bowl so you won't be tempted to add extra sodium or sugar at the table.

- Limit saturated fats. Eat more fish and legumes and less red meat. Use nut and vegetable oils instead of butter or other fats derived from animals.
- Always check for trans fats on nutrition facts labels. Try to avoid these harmful artificial fats completely.
- Increase omega-3 fatty acids. Foods that contain these essential fatty acids include salmon, walnuts, flax seeds, and canola oil.
- Stay hydrated. Eat foods high in water, such as fruits and vegetables. Also try to drink 2 liters (about 8 cups) of fluids each day. Choose water or unsweetened beverages such as tea or coffee instead of sweetened beverages. Sweetened drinks such as soft drinks contain no nutrients except sugar. Frequent consumption of sweetened beverages is a major risk factor for metabolic syndrome, obesity, type 2 diabetes, and cardiovascular disease.
- Engage in at least 30 minutes of physical activity most days of the week. Besides all the other benefits of exercise to human health, such as strong bones and muscles, exercise uses energy that helps to balance the Calories in food.

Next>Practicing Mindful Eating

Class 3-1: Eating for Wellness

Practicing Mindful Eating

Infographic included under free use from Mindful.Org's "6 Ways to Practice Mindful Eating"

The following has been adapted and excerpted from the Canada's Food Guide pages "Be mindful of your eating habits" and "Take time to eat" under fair use:

Benefits of being mindful of your eating habits

Being mindful of your eating habits means being aware of:

- how you eat
- why you eat
- what you eat
- when you eat
- where you eat
- how much you eat

Being mindful can help you:

- make healthier choices more often
- make positive changes to routine eating behaviours
- be more conscious of the food you eat and your eating habits
- create a sense of awareness around your every day eating decisions
- reconnect to the eating experience by creating an awareness of your:
    - feelings
    - thoughts
    - emotions
    - behaviours

How to be mindful of your eating habits

Use these ideas to help you be mindful of your eating habits.

Create a healthy eating environment

Your eating environment changes depending on where you live, learn, work and play. Focus your attention on eating and your eating environment.

Regardless of where you are, try to make changes to your surroundings so that the healthy choice is the easy choice.

Use your senses

Being mindful of the foods you eat encourages you to pay attention to the aromas, textures, flavours and taste of food. Pay attention to your likes and dislikes using these senses. This may help connect you to your eating experience and be more conscious of the food you are eating.

Consider your eating habits

Think about the last meal or snack that you had. Can you describe:

- how you ate?
  - did you eat slowly?
  - were you distracted?
  - did you eat with others?
- why you ate?
  - were you hungry?
  - was it offered to you?
- what you ate?
  - what did you have to eat and drink?
- when you ate?
  - what time was it?
  - how long had it been since the last time you ate?
- where you ate?
  - were you in a space meant for eating?
- how much you ate?
  - how much food and drink did you have?

Being able to recall and describe answers to these questions means you were likely being mindful of your eating habits.

Benefits of taking time to eat

Taking time to eat can help you:

- enjoy your food
- focus on your food
- prevent overeating
- enjoy eating with others
- make healthier food choices
- be mindful of your eating habits and choices

With busy lifestyles, it is common:

- to eat quickly
- to eat while distracted or doing other things
- not to set aside time to eat and plan meals

Eating quickly can prevent you from knowing when you are full. Eating while distracted or doing other things, such as watching TV, can increase how much you eat and drink. When distracted, people may eat larger portions or lose track of how much they have already eaten. This can lead to eating more than you need.

Healthy eating habits include taking the time to make food an important part of your life.

How to take time to eat

There are different ways you can take time to eat.

Eat slowly and thoughtfully

Focus on your food while you are eating. To do this:

- notice when you feel full
- don't rush when eating out
- put your knife and fork down between bites
- eat with others and enjoy the conversation with friends and family
- slow down and allow yourself time to enjoy your food
- chew your food thoroughly to experience all of the:
    - aromas
    - textures
    - flavours and taste

Eat without distractions

Pay attention when you are eating:

- Computers, cell phones and other electronics distract from eating. Make mealtimes "electronic free."
- Sit down at the table instead of in front of a TV. Focus meals around the food.
- At work, step away from your workstation and eat lunch in the cafeteria or outside with coworkers.

Think about your portions when eating. Eating when you are distracted may increase the likelihood of you eating too much:

- of what you are currently eating

- in future meals and snacks

Set aside time

Plan to make eating an important part of your life. You can do this by:

- setting aside time to focus on your meals and snacks whether you are:
    - at work
    - at home
    - on the go

Next>Resources for Healthy Eating

Class 3-1: Eating for Wellness

Resources for Healthy Eating

Resources

Beyond the text you have just read, there are many verified and quality resources available to the public.

Given what you've learned earlier in the course about misinformation around health, knowing how to find and use these verified sources is valuable for you, as well as your friends and family who may have questions.

Nutrition.Gov

Sponsored by the United States Department of Agriculture, the Nutrition.Gov website offers a plethora of information.

This includes a Questions and Answers page that you may want to bookmark or send to friends and family.

They also offer many other guides:

Basic primer on nutrients in food

Culture and Food

Plant-Based Meals and Eating Vegetarian

Dietary Supplements Information

Information and tips on food preparation and cooking

Lists of local farmer's markets:

SnapED

SNAP-Ed is a free resource connected to the USDA's Supplemental Nutrition Assistance Program (SNAP) that provides assistance to citizens (especially children and the elderly) to purchase healthy food.

They offer many resources that you may find helpful:

Eat Right When Money's Tight handout

Guide to Seasonal Produce

Gardening (Growing your own Food)

Spanish Language Materials

As well they link to other easy-to-use resources for eating on a budget, such as Iowa State University's "Spend Smart, Eat Smart" and the "Eating Healthy on a Budget" guide from the state of New York.

There are many misconceptions about SNAP benefits and how they are used. The Snaptohealth.org website hosts a Frequently Asked Questions page that addresses many of these misconceptions.

EatFresh.org

Eatfresh.org is the outreach arm of CalFresh, California's version of SNAP. Their easy-to-navigate website offers extensive information about nutrition and resources for practical, healthy eating:

Discover Foods

Ask A Dietician

Find a Recipe

Next>Summary

Class 3-1: Eating for Wellness

Summary

Major Points

During today's class, you have learned:

- Six major classes of nutrients - substances the body needs for energy, building materials, and body processes.
    - carbohydrates, proteins, lipids, water, vitamins, and minerals
    - Essential nutrients must be obtained from food
    - Nonessential nutrients can be synthesized by the body.
    - Macronutrients - the body needs in relatively large quantities
    - Micronutrients - the body needs in relatively small quantities.
- Phytochemicals and their potential role in maintaining normal body functions and good health.
- Guidelines for healthy eating and good nutrition, and why a healthy diet can reduce the risk of many diseases.
- Being mindful of your eating habits means being aware of:
    - how you eat
    - why you eat
    - what you eat
    - when you eat
    - where you eat
    - how much you eat
- Resources for Reliable Nutrition Information
    - SNAP-Ed Resource Database
    - Nutrition.Gov Questions and Answers
    - EatFresh.org Ask A Dietician

Class 3-2: Challenges to Eating Well

Overview

Today's Class Overview

In today's class, you will complete our section on nutrition by exploring some nutrition-related challenges to wellness.

Today's Class Objectives

By the end of this module you should be able to:

1. Recognize common eating disorders and how they can be treated.
2. Identify the health impacts of obesity.
3. Discuss issues related to undernutrition and food access.
4. Find reliable nutrition information.
5. Think critically about the impact of marketing on your nutrition.
6. Connect this information to ideas from our earlier classes.

Outline of Today's Class

- Materials
    1. Overview
    2. Review
    3. Eating Disorders
    4. Obesity
    5. Undernutrition
    6. What is a Food Desert?
    7. Case Study Conclusion
    8. Food Marketing and You
    9. Guide to Reading Food Labels
    10. Summary

Next>Review

Class 3-2: Challenges to Eating Well

Review

Reviewing 3-1: Eating for Wellness

- Six major classes of nutrients - substances the body needs for energy, building materials, and body processes.
    - carbohydrates, proteins, lipids, water, vitamins, and minerals
    - Essential nutrients must be obtained from food
    - Nonessential nutrients can be synthesized by the body.
    - Macronutrients - the body needs in relatively large quantities
    - Micronutrients - the body needs in relatively small quantities.
- Phytochemicals and their potential role in maintaining normal body functions and good health.
- Guidelines for healthy eating and good nutrition, and why a healthy diet can reduce the risk of many diseases.
- Being mindful of your eating habits means being aware of:
    - how you eat
    - why you eat
    - what you eat
    - when you eat
    - where you eat
    - how much you eat
- Resources for Reliable Nutrition Information
    - SNAP-Ed Resource Database
    - Nutrition.Gov Questions and Answers
    - EatFresh.org Ask A Dietician

Next>Eating Disorders

Class 3-2: Challenges to Eating Well

Eating Disorders

The following has been excerpted and adapted from "Human Biology Butte 17-18" by CK-12 licensed CC BY-NC 3.0:

Eating Disorders

What Are Eating Disorders?

Eating disorders are mental health disorders defined by abnormal eating habits that adversely affect health. Eating disorders typically begin during late childhood, adolescence, or early adulthood. In developed countries such as the United States, they occur in about 4 percent of people and are much more common in females than males. In developing countries, they are less common but increasing in frequency. Eating disorders are serious diseases and can even be fatal. In fact, they result in about 7,000 deaths a year in the United States, making them the mental disorders with the highest mortality rate.

Major Eating Disorders

Common eating disorders in the United States include anorexia nervosa, bulimia nervosa, and binge eating disorder. They differ in the patterns of disordered eating that characterize them, but all of them can have life-threatening health consequences. They may also have similar causes.

- Anorexia nervosa is an eating disorder in which people consistently eat very little and become extremely thin. They may also develop amenorrhea and other serious health problems. People with anorexia nervosa often fail to appreciate how thin they are and how severe their illness is.
- Bulimia nervosa is an eating disorder in which people recurrently binge on large amounts of food, followed by purging the food from the body through vomiting, using laxatives, exercising excessively, or other methods. People with bulimia nervosa may have normal weight but often have serious health problems such as electrolyte imbalances and irregular heartbeat.

- Binge eating disorder is an eating disorder in which people repeatedly binge on large amounts of food, followed by feelings of guilt but not by purging. This generally leads to excessive weight gain, obesity, and other serious disorders.

Causes of Eating Disorders

The causes of eating disorders are not fully understood and are likely to vary among individuals. However, in virtually all cases, both biological and environmental factors appear to play a role.

Biological Factors

Genes are likely to be involved in the development of eating disorders, because having a close biological relative with an eating disorder increases one's own risk tenfold or more. At a biochemical level, eating disorders are thought to be caused in part by dysregulation of neurotransmitters such as serotonin and dopamine. Serotonin normally has an inhibitory effect on eating and dopamine regulates the reward property of food. Imbalance in these neurotransmitters is likely to affect appetite and eating behavior. Dysregulation of the hormones leptin and ghrelin may also be involved in eating disorders. These two hormones normally help maintain the body's energy balance by increasing or decreasing food intake. This occurs through the regulation of appetite and eating behavior. **Leptin** is produced mainly by fat cells in the body. It normally inhibits appetite by inducing a feeling of satiety. **Ghrelin** is produced in the stomach and small intestine. Its normal role is to stimulate appetite. If these hormones are out of balance, the imbalance will affect appetite and may lead to disordered eating.

Environmental Factors

A number of environmental factors have also been shown to increase the risk of developing eating disorders. One of the most salient is abuse suffered as a child, including physical, psychological, or sexual abuse. Child abuse has been shown to triple the risk of developing an eating disorder. Parental pressure to control a child's eating habits can also increase the risk, as can having a fragile sense of self-identify. In older individuals, social isolation increases the risk of eating disorders.

Cultural idealization of thinness in females is thought to be a major contributing cause of anorexia and bulimia nervosa. It may be part of the

reason that these two eating disorders occur ten times more often in females than males. Dancers (like the one pictured below) and athletes such as gymnasts are two groups of young women who may feel exceptional pressure to be thin. Up to 12 percent of female dancers develop anorexia or bulimia, compared with about 2 percent of females in the general population.

Treatment and Recovery

Treatment of eating disorders varies according to the type and severity of the eating disorder. Usually, more than one treatment option is used. Treatment typically includes mental health counseling, which can take place in a variety of settings, such as a community program, private practice, or hospital. Treatment may also include the use of antidepressants or other medications because many people with eating disorders also suffer from depression or other mental health disorders. Nutritional counseling is often recommended as well. Hospitalization is occasionally required, in many cases to treat the adverse physical health consequences of the disordered eating.

The goal of treatment is recovery, including gaining control of eating, adopting normal eating habits, and attaining a normal weight. About 50 to 85 percent of people with eating disorders recover with treatment. However, some may have to struggle to maintain normal eating behaviors throughout the rest of their life.

Feature: Reliable Sources

People with anorexia nervosa, as with many other health problems, may seek information and advice online before or instead of contacting a healthcare professional. The web offers a plethora of useful information on eating disorders, including anorexia nervosa, but some websites, blogs, and social media pages actually have the agenda of promoting disordered eating. The term *pro-ana* (from "pro-anorexia") refers to organizations, websites, and other sources that promote anorexia nervosa. Their mission is to normalize or even glamorize anorexia nervosa. They defend it as a lifestyle choice and an accomplishment of self-control rather than as a mental disorder. Research has shown that visiting pro-ana sites can have a negative impact on eating behavior in people both with and without eating disorders. After visiting such sites, people tend to decrease their Caloric intake, although most of them do not actually perceive that they have reduced their intake of Calories.

Following a 2001 episode of the *Oprah Winfrey Show* that focused on pro-ana, the mainstream press started covering the issue. Pressure from the public and pro-recovery organizations led to some social media and other websites adopting policies of blocking pro-ana pages or labeling them with warning messages. As result, many pro-ana groups have taken steps to conceal themselves. For example, they may claim that they are simply providing a nonjudgmental forum for people with anorexia nervosa to discuss their disorder. They may also claim that they exist in part to provide support those who choose to enter recovery.

Some clues that a website or page may be pro-ana include providing information on topics such as:

- crash dieting techniques and recipes.
- socially acceptable pretexts for refusing food, such as veganism.
- ways to hide weight loss from parents and doctors.
- reducing the adverse health effects of anorexia.
- ways to ignore or suppress hunger pangs.

Next>Obesity

Class 3-2: Challenges to Eating Well

Obesity

The following has been excerpted and adapted from "Human Biology Butte 17-18" by CK-12 licensed CC BY-NC 3.0:

What Is Obesity?

Obesity is a disease in which excess body fat has accumulated to the extent that it is likely to have negative effects on health.

Causes of Obesity

Like many other diseases, most cases of obesity are the result of an interplay between genetic and environmental factors. Obesity is most commonly caused by a combination of excessive food intake, inadequate physical activity, and genetic susceptibility.

Genetic Influences on Obesity

Various genes that control appetite and metabolism predispose people to developing obesity when sufficient food energy is present. It is likely that dozens of such genes exist. Family studies reveal the strength of the genetic influence on obesity. When both parents are obese, 80 percent of their offspring will also be obese. For comparison, when both parents are of normal weight, less than 10 percent of their offspring will be obese.

Diet and Obesity

From 1971 to 2000 in the United States, the average amount of food consumed by women actually increased by 335 Calories per day and by men by 168 Calories per day. During the same period, the rate of obesity in U.S. adults increased from about 15 to 31 percent. Most of the extra food energy came from an increase in carbohydrate consumption. Primary sources of these extra carbohydrates were sugar-sweetened beverages, like those pictured below. Sugary beverages include not only soft drinks but also fruit drinks, sweetened iced tea and coffee, and energy- and vitamin-water drinks. Such drinks now account for almost 25 percent of daily food energy in young adults in the United States. This is an alarming statistic, given that these drinks provide no other nutrients except energy.

Activity Levels and Obesity

A sedentary lifestyle plays a significant role in obesity. Worldwide, there has been a large shift toward less physically demanding work. There has also been an increased reliance on cars and labor-saving devices at home. Currently, an estimated 30 percent of the world's population gets insufficient exercise.

Other Causes of Obesity

A minority of cases of obesity are caused by certain medications or by other diseases. Medications that may increase the risk of obesity include antidepressant and antipsychotic drugs, steroids such as prednisone, and some forms of hormonal contraception, among others. Diseases that increase the risk of obesity include hypothyroidism, Cushing's disease, binge eating disorder, and Prader-Willi syndrome.

Consider Prader-Willi syndrome as an example. A young child with this syndrome is pictured below. The syndrome occurs due to loss of function of specific genes on chromosome 15. Symptoms of the syndrome include constant hunger, which typically leads to severe obesity in childhood. Prader-Willi syndrome is caused by genetic defects but it is not generally inherited. Instead, the genetic changes happen during the formation of the egg or sperm or during embryonic development.

Pathophysiology of Obesity

A recently proposed physiological mechanism for the development of obesity is leptin resistance. Leptin is called the satiety hormone. It is secreted by fat cells and helps to regulate appetite based on the body's fat reserves. When fat reserves are high, more leptin is secreted and appetite is inhibited, so you eat less. The opposite occurs when fat reserves are low. In obesity, decreased sensitivity to leptin occurs, resulting in an inability to detect satiety despite high fat reserves. As a consequence, people wth leptin resistance never feel satiated and are likely to overeat and gain more weight.

Health Consequences of Obesity

Obesity increases the risk of many other health problems and diseases, including cardiovascular disease, type 2 diabetes, fatty liver, certain types of cancer, pancreatitis, osteoarthritis, obstructive sleep apnea, and asthma. The health consequences of obesity are mainly due to the effects of either

increased fat mass or increased numbers of fat cells. Extra weight from excess body fat places a lot of stress on the body and its organ systems, causing diseases such as osteoarthritis and obstructive sleep apnea. An increased number of fat cells increases inflammation and the risk of blood clots. It also changes the body's metabolism, altering the body's response to insulin and potentially leading to insulin resistance and type 2 diabetes. This explains why the link between obesity and type 2 diabetes is so strong. Obesity is thought to be the root cause of 64 percent of cases of type 2 diabetes in men and 77 percent of cases in women.

Treating and Preventing Obesity

Most cases of obesity are treatable or preventable through changes in diet and physical activity that restore energy balance to the body. In fact, obesity is one of the leading preventable causes of disease and death worldwide. The amount of energy provided by the diet can be reduced by decreasing consumption of energy-dense (high-Calorie) foods, such as foods high in fat and sugar, and increasing consumption of high-fiber foods. Fiber in the diet cannot be digested, so it adds bulk and a feeling of fullness without adding Calories. All types of low-carbohydrate and low-fat diets appear equally beneficial in reducing obesity and its health risks. In some cases, medications may be prescribed to help control obesity by reducing appetite or fat absorption.

Public Health Approaches

Public health approaches to the problem of obesity include efforts to understand and correct the environmental factors responsible for increasing obesity rates. The goals are to reduce food energy consumption and promote energy expenditure in physical activity. Efforts to reduce energy consumption include promoting healthy meals and limiting access to sugary beverages and junk foods in schools. Efforts to promote physical activity include increasing access to parks and developing pedestrian routes in urban environments.

Next>Undernutrition

Class 3-2: Challenges to Eating Well

Undernutrition

The following has been excerpted and adapted from "Human Biology Butte 17-18" by CK-12 licensed CC BY-NC 3.0:

Undernutrition

Defining Undernutrition

Undernutrition is defined as insufficient intake of nutritious foods. People who are undernourished are likely to have low body fat reserves, so one indicator of undernutrition in individuals is a low body mass index (BMI). Adults are considered underweight if their body mass index (BMI) is less than 18.5 kg/m^2. Children are considered underweight if their BMI is less than the 5th percentile of the reference values for children of the same age.

Undernutrition in Children

The effects of undernutrition are particularly important during childhood, when energy and other nutrients are needed for normal growth and development. Children are more likely than adults to become severely undernourished as well as to suffer permanent effects from undernutrition. They may become dangerously thin, with loss of muscle as well as fat. This is called **wasting**. If they lack adequate energy for growth, they will stop growing. If they are chronically undernourished, the growth deficits may cause them to be too short for their age. This is called **stunting.** Unless adequate nutrition becomes available later so they can make up their growth deficits, stunted children will end up shorter than their genetic potential for height by the time they are adults.

Undernutrition and Infection

Undernutrition and infectious diseases in children have a positive synergistic relationship. Each increases the risk of the other and makes the other worse. Children who are undernourished may be weakened and have a less than robust immune system. This makes them more susceptible to infectious diseases and likely to become sicker when they have infectious

diseases. Children who are sick with infectious diseases may need more nutrients to defend against infection. At the same time, they may have reduced intake or absorption of nutrients due to symptoms such as vomiting and diarrhea. In these ways, infectious disease increases the risk of undernutrition or makes existing undernutrition worse.

Undernutrition and Low Birthweight

Many children are born with the disadvantage of low birthweight (< 2.5 kg, or 5.5 lb.) caused by maternal undernutrition and intrauterine growth restriction. Babies with low birthweight are more susceptible to disease and more likely to die in infancy. In children that survive infancy, low birthweight may result in slow growth and developmental delays throughout early childhood.

Undernutrition Syndromes

Severe cases of undernutrition may develop into life-threatening syndromes such as kwashiorkor, first described in the medical literature in the 1930s. The name comes from a West African word meaning “disease of the deposed child.” The original meaning of the term is a clue to the cause of this syndrome. If a young child is weaned from the breast so a new baby can be breastfed, the “deposed child” is likely to go from a mostly breastmilk diet, which is high in protein, to a mostly plant-food diet, which is low in protein. Although Kwashiorkor may occur in a child who lacks protein but not Calories, it occurs more often when the diet is also deficient in Calories. That’s why kwashiorkor is commonly called protein-Calorie malnutrition.

The defining sign of kwashiorkor in an undernourished child is edema (swelling) of the ankles and feet and often a distended belly, both of which are clearly visible in the child pictured below. The lack of protein causes osmotic imbalances that prevent tissue fluids from being returned to the bloodstream. This mechanism accounts for the accumulation of fluid in the ankles, feet, and abdomen. Other common signs of kwashiorkor include enlarged liver (which contributes to the abdominal distension), thinning hair, loss of teeth, skin rash, and skin and hair depigmentation. Children with kwashiorkor may also be irritable and lose their appetite. Kwashiorkor can have a long-term impact on a child's physical and mental development and frequently leads to death without treatment.

Marasmus

Marasmus comes from a Greek word meaning "wasting away." It is a severe undernutrition syndrome caused by extremely low intakes of food energy. Signs and symptoms of marasmus include wasting (as depicted below), low body temperature, anemia, dehydration, weak pulse, and cold extremities. Without treatment, marasmus is often fatal, although it generally has a better prognosis than untreated kwashiorkor.

Micronutrient Deficiencies

Besides deficiencies in food energy and protein, many undernourished people suffer from deficiencies of specific vitamins or minerals. Some of the most common micronutrient deficiencies worldwide are iron, vitamin A, and iodine deficiencies.

Iron Deficiency

Iron deficiency is the single most common micronutrient deficiency worldwide, affecting about 2 billion people. Iron deficiency, in turn, causes anemia, which is especially common in women and children under the age of five years. Anemia can lead to increased mortality in infancy and poor cognitive and motor development in early childhood. The problems caused by iron-deficiency anemia in childhood cannot be reversed.

Vitamin A Deficiency

Vitamin A deficiency is also very common in developing countries. In young children, vitamin A plays an essential role in the development of the immune system, so vitamin A deficiency adversely affects the ability of the immune system to fight off infections. Vitamin A deficiency also contributes to anemia and causes visual impairments, ranging from night blindness (inability to see well at low light levels) to total blindness.

Iodine Deficiency

Since the early 1900s, iodine has been added to salt in many countries, including the United States and most of Europe, virtually eliminating iodine deficiency in these countries. However, inadequate iodine intake is still a public health problem in dozens of countries, and about 30 percent of the world's people are iodine deficient.

Iodine is needed for thyroid hormone production. In adults, iodine deficiency causes reversible signs and symptoms of inadequate thyroid hormone. These may include an enlarged thyroid gland, called a goiter (see the photo below), and a sluggish metabolism. In children, iodine deficiency is much more serious. It causes permanent intellectual disability because thyroid hormone is needed for normal brain growth and development, from the fetal stage through early childhood. Iodine deficiency is the most important cause of preventable intellectual disability in the world.

Causes of Undernutrition

A small percentage of undernutrition occurs because of diseases such as cancer, anorexia nervosa, celiac disease, and cystic fibrosis (all of which you can read about in other concepts). However, the vast majority of undernutrition globally occurs because people simply don't have enough nutritious food to eat. They take in less energy than the minimum daily energy requirement so they are underweight, and they are likely to have other nutritional deficiencies as well. Worldwide food supplies are adequate to provide food to all, if the food supplies were equally distributed and accessible to everyone.

Although undernutrition is not as common in the richer nations of the world as it is elsewhere, it still occurs in significant proportions of people. Even in a land of plenty like the United States, socioeconomic disparities result in some people being undernourished due to lack of access to sufficient nutritious food. Besides lacking adequate money to buy nutritious foods, many poor people in the United States live in areas that are considered "food deserts," defined as areas with limited access to nutritious foods. In these food deserts, supermarkets with fresh produce and other nutritious food choices are typically too far away for people to utilize. Instead, they must rely on small neighborhood stores that stock mainly over-priced processed foods or on fast food restaurants that offer primarily high-fat and high-sugar food options. With social inequalities on the rise in the United States and some other rich nations, problems of food access and undernutrition may worsen.

Treatment and Prevention of Undernutrition

Treating and preventing undernutrition is a huge and complex problem requiring multifaceted approaches. Potential solutions must target both individual and public health. Meeting individual needs is generally

achieved through direct nutrition interventions (like the one illustrated in the following photo). In such interventions, the health-care sector typically delivers nutritional supplements directly to acutely malnourished people who might otherwise require hospitalization. Public health interventions may focus on improvements in agriculture, water, sanitation, or education, among other public health targets. Some of the most successful public health interventions have been those aimed at eliminating specific micronutrient deficiencies. For example, in the early 1990s, iodine deficiency was addressed by a global campaign to iodize salt. This campaign reduced the rate of iodine deficiency from about 70 percent to 30 percent.

Next>What is a Food Desert?

Class 3-2: Challenges to Eating Well

What is a Food Desert?

The following has been excerpted from "The Grocery Gap: Who Has Access to Healthy Food and Why it Matters ," a policy report by the non-profit organization The Food Trust under fair use:

What is a Food Desert?

An apple a day? For millions of Americans—especially people living in low-income communities of color— finding a fresh apple is not so easy.

In hundreds of neighborhoods across the country, nutritious, affordable, and high quality food is out of reach.

Full-service grocery stores, farmers' markets, and other vendors that sell fresh fruits, vegetables, and other healthy foods cannot be found in their neighborhoods.

What can be found, often in great abundance, are convenience stores and fast food restaurants that mainly sell cheap, high-fat, high-sugar, processed foods and offer few healthy options.

Without access to healthy foods, a nutritious diet and good health are out of reach.

And without grocery stores and other fresh food retailers, communities are missing the commercial hubs that make neighborhoods livable, and help local economies thrive.

As concerns grow over healthcare and the country's worsening obesity epidemic, "food deserts"—areas where there is little or no access to healthy and affordable food—have catapulted to the forefront of public policy discussions.

Residents of many urban low-income communities of color walk outside their doors to find no grocery stores, farmers' markets, or other sources of fresh food. Instead they are bombarded by fast food and convenience stores selling high-fat, high-sugar, processed foods.

Rural residents often face a different type of challenge—a lack of any nearby food options.

This has been a persistent problem for communities.

Beginning in the 1960s and 1970s, white, middle-class families left urban centers for homes in the suburbs, and supermarkets fled with them.

Once they left the city, grocers adapted their operations to suit their new environs, building ever-larger stores and developing chain-wide contracts with large suppliers and distributors to stock the stores with foods demanded by a fairly homogeneous suburban population.

Over the past several decades, the structure of the grocery industry has changed dramatically, with significant consolidation and growth in discount stores and supercenters and specialty/natural food retailers.

At the same time, alternative sources of fresh foods such as farmers' markets, produce stands, and community-supported agriculture programs have proliferated, though predominantly in middle-class or affluent communities.

Policymakers at the local, state, and national level have begun recognizing the role that access to healthy food plays in promoting healthy local economies, healthy neighborhoods, and healthy people.

This report, a summary of our current knowledge about food deserts and their impacts on communities, provides evidence to inform this policymaking.

Findings of Their Review of Research

1. Accessing healthy food is a challenge for many Americans—particularly those living in low-income neighborhoods, communities of color, and rural areas.

- Lack of supermarkets. A 2009 study by the U.S. Department of Agriculture found that 23.5 million people lack access to a supermarket within a mile of their home.
    - A recent multistate study found that low-income areas had half as many supermarkets as wealthy tracts.
    - A nationwide analysis found that 20 percent of rural counties are rural "food desert" where all residents live more than 10 miles from a supermarket or supercenter.

- Lack of healthy, high quality foods in nearby food stores.
    - In Albany, New York, 80 percent of nonwhite residents cannot find low-fat milk or high-fiber bread in their neighborhoods.
    - In Baltimore, 46 percent of lower-income neighborhoods have limited access to healthy food (based on a healthy food availability survey) compared to 13 percent of higher-income neighborhoods.
- Predominance of convenience/corner/ liquor stores.
    - Nationally, low-income zip codes have 30 percent more convenience stores, which tend to lack healthy items, than middle-income zip codes.
- Lack of transportation access to stores
    - Residents in many urban areas have few transportation options to reach supermarkets.
    - In Mississippi—which has the highest obesity rate of any state—over 70 percent of food stamp eligible households travel more than 30 miles to reach a supermarket

2. Better access corresponds with healthier eating; Studies find that residents with greater access to an abundance of healthy foods consume more fresh produce and other healthful items.

- A survey of produce availability in New Orleans' small neighborhood stores found that for each additional meter of shelf space devoted to fresh vegetables, residents eat an additional 0.35 servings per day.
- In rural Mississippi, adults living in "food desert" counties lacking large supermarkets are 23 percent less likely to consume the recommended fruits and vegetables than those in counties that have supermarkets, controlling for age, sex, race, and education.

3. Access to healthy food is associated with lower risk for obesity and other diet-related chronic diseases.

- A multistate study found that people with access to only supermarkets or to supermarkets and grocery stores have the lowest rates of obesity and overweight and those without access to supermarkets have the highest rates.
- In California and New York City, residents living in areas with higher densities of fresh food markets, compared to convenience stores and fast food restaurants, have lower rates of obesity.

- In California, obesity and diabetes rates are 20 percent higher for those living in the least healthy "food environments," controlling for household income, race/ethnicity, age, gender, and physical activity levels.

4. New and improved healthy food retail in underserved communities creates jobs and helps to revitalize low-income neighborhoods.

- Though the economic impacts of food retailers are understudied, we know that grocery stores contribute to community economic development.
- Analysis of a successful statewide public-private initiative to bring new or revitalized grocery stores to underserved neighborhoods in Pennsylvania provides positive evidence that fresh food markets can create jobs, bolster local economies, and revitalize neighborhoods.
- The effort has created or retained 4,860 jobs in 78 underserved urban and rural communities throughout the state.

The evidence is clear that many communities— predominantly low-income, urban communities of color and rural areas—lack adequate access to healthy food, and the evidence also suggests that the lack of access negatively impacts the health of residents and neighborhoods.

These findings indicate that policy interventions to increase access to healthy food in "food deserts" will help people eat a healthy diet, while contributing to community economic development.

Next>Case Study Conclusion

Class 3-2: Challenges to Eating Well

Case Study Conclusion

The following has been excerpted and adapted from "Human Biology Butte 17-18" by CK-12 licensed CC BY-NC 3.0:

Case Study Conclusion

Case Study Conclusion: What's Wrong with Fast Food?

Last week, we began to ask what is wrong with fast food.

That is the question that Carlos, who you read about in the beginning of this section, asked himself after learning that his friend Kevin eats it five or six times a week, and thinks that this diet is not necessarily that bad for him. In order to find some answers, Carlos went to the website of Kevin's favorite fast food restaurant and found nutritional information for his typical meal of a cheeseburger, large fries, and a large soda. Some of the information he found is shown in the tables below. Knowing what you now know about nutrition, what aspects of this meal could potentially be harmful to Kevin's health if he eats like this frequently?

Nutritional Information for a Typical Fast Food Meal

Food	Calories	Total Fat (%DV)	Saturated Fat (%DV)	Trans Fat	Carbohydrates (%DV)
Burger	540	43%	49%	1 g	15%
Fries	510	37%	17%	0 g	22%
Soda	300	0%	0%	0 g	27%
Total	**1,350**	**80%**	**66%**	**1 g**	**64%**

Food	Sodium (%DV)	Iron (%DV)	Vitamin A (%DV)	Vitamin C (%DV)	Calcium (%DV)
Burger	40%	25%	10%	2%	15%
Fries	15%	6%	0%	30%	2%
Soda	1%	0%	0%	0%	0%
Total	**56%**	**31%**	**10%**	**32%**	**17%**

% DV = percentage of adult recommended daily value (DV) for each nutrient, based on a 2,000 Calorie a day diet.

As Carlos already said to Kevin, fast food meals are often very high in calories. This meal has 1,350 Calories. A typical adult should consume around 2,000 Calories a day, so this single meal has more than half the calories typically needed by a person in one day. Some fast food meals have even more calories. The cheeseburger in this meal has 540 Calories, which is typical for a moderately-sized fast food cheeseburger. But some larger fast food burgers, or burgers with more toppings, can have over 1,000 Calories! As you can see, it can be quite easy to exceed your calorie recommendation for the day if you eat a typical fast food meal, considering that you will probably eat two other meals that day as well.

What is the problem with consuming excess calories? As you have learned, it is important to maintain energy homeostasis — that is, a balance between the energy you consume and what your body uses. If you eat more calories than your body needs, you will store that extra food energy as fat, which can cause you to become obese. Obesity raises the risk of many diseases and health problems, including cardiovascular disease, type 2 diabetes, stroke, liver disease, cancer, pancreatitis, osteoarthritis, sleep apnea, and asthma. Many of these medical conditions can be deadly, which is why obesity can shorten a person's lifespan. Although Kevin is only slightly overweight at this point, if he regularly consumes more calories than he uses (which is likely with a diet high in fast food) he will gain excess body fat, raising his risk of obesity and its associated diseases.

Why do typical fast food meals have so many calories even if they don't appear to be particularly large? For one, these foods are typically high in fat. Notice that this meal contains 80% of the recommended daily value (DV) of total fat — close to the limit for the entire day! As you have learned, fat is energy dense. One gram of fat has nine Calories, while one gram of protein or carbohydrate has only four Calories. This means that meals high in fat, like this one, will generally have more calories than a lower fat meal of equivalent size. The large amount of fat in the burger and fries contributes to the high energy density of this meal.

But fat isn't the only reason this meal is so high in calories. The soda contains 300 Calories — about the same number of calories as three apples! For most people, three apples would be more satiating than a soda. This is in part because apples have fiber, which is filling. As you have learned, sodas and other sugary beverages generally have no other nutrients besides carbohydrates. You can see from the tables that the soda is the largest contributor of carbohydrates to this meal, with very few other nutrients. If Kevin is frequently drinking large sodas, he is getting a significant percentage of his calories from a substance that is not giving him a feeling of fullness, which may cause him to consume more calories overall. In fact, many scientists think that the increase in consumption of sugary beverages has been a major contributor to the obesity epidemic.

Besides excess calories, what nutrients in this meal could cause health problems? This meal has both a high percentage of saturated fat (66% DV) as well as some trans fat. The American Heart Association recommends that people limit their consumption of saturated fat, since it has been shown to raise the risk of heart disease. Trans fats are particularly dangerous, and can increase the risk of heart disease, stroke, and type 2 diabetes. In fact, in 2015 the U.S. Food and Drug Administration (FDA) ruled that trans fats have not been shown to be safe for human consumption, and ordered food producers to remove them from the food supply by 2018. While some fast food restaurants voluntarily removed trans fats from their food prior to this time, as of early 2017 some restaurants still had items containing trans fats on their menus —like the burger from Kevin's favorite restaurant.

Another nutrient that fast food meals tend to have too much of is sodium. This meal has over half the sodium you should eat in a day, mostly from the burger. And this burger isn't the worst one around — some fast food burgers have *double* the recommended DV for sodium! Burgers with

bacon are particularly high in sodium. Consumption of excess sodium can lead to high blood pressure, cardiovascular disease, and stroke.

Consumption of excess nutrients is not the only concern when a person frequently eats fast food. As you can see from the tables, this meal is relatively low in some vitamins and minerals such as vitamin A (10% DV) and calcium (17% DV). As you have learned, vitamin A is important for maintaining normal vision and, in young children, the development of the immune system, among other functions. Calcium is a macromineral needed for bone strength, neutralizing acidity in the digestive tract, and nerve and cell membrane functions. Eating a diet low in specific nutrients can cause a form of malnutrition called unbalanced nutrition. If Kevin eats meals like this frequently, he would have to make sure to get plenty of essential nutrients from other sources in order to maintain his health, which may be difficult if fast food takes the place of healthier foods in his diet. Carlos was correct to be concerned about the lack of fresh food in most fast food meals. Fresh fruits and vegetables contain fiber, phytochemicals, and many vitamins and minerals that are important for maintaining health.

But as Kevin brought up, is fast food worse than other types of food? While it tends to be particularly high in calories, fat, and sodium, and is not very nutrient dense, the same is true for many other types of meals eaten outside the home. Many chain restaurants have nutritional information listed on their website — you can look up some of your favorites. You might be surprised to learn that some restaurant entrees contain more than 2,000 Calories for a single meal, combined with an excessive amount of saturated fat and sodium. These items are just as bad or worse for your health than some fast food meals.

The keys to healthy eating are to know what you are consuming and to make good choices. Preparing fresh food at home is usually healthier than eating out, but most restaurants have some healthier options. After Carlos tells Kevin what he found out about Kevin's favorite meal, Kevin decides to make some changes. He doesn't want to face a future of obesity and potentially life-threatening health conditions. He decides to pack a healthy lunch to take with him during the day, and will eat more dinners at home. When he does occasionally eat fast food, he will make better choices. Skipping the soda will easily save him 300 Calories. Kevin loves fries, but he realizes that if he orders small fries instead of large, he can save 280 Calories and 20% DV of total fat. If he orders a smaller cheeseburger, he can save an additional 240 Calories and 25% DV total fat. Then if he is still

hungry, he can add a piece of fruit from home for additional nutrients. He will also try other options at fast food restaurants, such as salads or grilled chicken sandwiches, which may be healthier. However, he should check the nutritional information first, since some seemingly healthy options can still be high in calories, fat, and salt due to added dressings, sauces, and cheese. Healthy eating and good nutrition doesn't have to be difficult if you are armed with information and make good choices with your long-term health in mind.

Next>Food Marketing and You

Class 3-2: Challenges to Eating Well

Food Marketing and You

The following has been adapted and excerpted from the Canada's Food Guide page "Marketing can influence your food choices" under fair use:

Food Marketing and You

Food marketing is advertising that promotes the sale of certain food or food products. Many foods and drinks that are marketed can contribute too much sodium, sugars or saturated fat to our eating patterns.

Food marketing can take on many forms, such as:

- branding
- sponsorship of events
- celebrity endorsements
- contests and sales promotions
- social media posts on:
    - Twitter
    - Pinterest
    - Snapchat
    - Facebook
    - Instagram
- commercials
    - on TV
    - on the radio
    - on the internet
    - before the start of movies
- product placement
    - on TV
    - in movies
    - in magazines
    - on social media posts
    - in music lyrics and videos

Newer forms of marketing like sponsored posts on social media can be more difficult to recognize. This can make it hard to know when you are being advertised to.

Astroturfing is the practice of masking the sponsors of a message or organization (e.g., political, advertising, religious or public relations) to make it appear as though it originates from and is supported by grassroots participants. It is a practice intended to give the statements or organizations credibility by withholding information about the source's financial connection. The term *astroturfing* is derived from AstroTurf, a brand of synthetic carpeting designed to resemble natural grass, as a play on the word "grassroots". The implication behind the use of the term is that instead of a "true" or "natural" grassroots effort behind the activity in question, there is a "fake" or "artificial" appearance of support. - via wikipedia.org

Marketing can also be targeted to you based on your personal data, like your:

- age and gender
- purchasing history
- web browsing history

Behavioural advertising tracks your personal data and online activities over time in order to deliver targeted ads.

How food marketing can affect your food choices

Food marketing is all around us. You likely receive a constant stream of changing and often conflicting messages about food. This can make it hard to make healthy food choices.

Food marketing can impact you in many different ways. It is designed to:

- create food trends
- encourage you to:
    - buy certain foods or drinks
    - buy foods in order to get promotional items such as:
        - loyalty points
        - tickets to movies or sports events
        - coupons for future food purchases
- create links between certain foods or brands and a particular lifestyle
- build brand loyalty so you will continue to purchase from a particular store or products with a brand name

Benefits of being aware of food marketing

Being aware of food marketing is a food skill that can help you:

- recognize when foods are being marketed to you

- decide whether a food item is healthy by using food labels rather than relying on marketing messages alone
- teach those who may be more vulnerable to food marketing, like young children and teens, about marketing techniques

How to be aware of food marketing when making food choices

Use these tips to help you make an informed choice:

Use food labels.

Stick to your grocery list and avoid impulse buys.

Question why you want to purchase a certain food or drink. Do you think:

- it's cool?
- it's healthy?
- it will improve your mood?
- it will provide nutritional benefit?

Question what form of marketing you got these ideas from, like:

- a sponsored blog post
- a celebrity endorsement
- messages on the product itself

Explore ways to lessen your exposure to ads. Try:

- limiting screen time
- using ad-free platforms
- downloading software that limits advertising and pop-ups

Learn about:

- what you can do to protect your privacy
- how your online browsing history can be used to send you targeted ads

Before you share or like content online like a video, game, blog or quiz ask:

- if you really want to share a promotion for a food or drink product

Talk with those around you about the effects of marketing. Ask each other:

- whether you have ever purchased foods even if you did not intend to and why you think that is
- what strategies you use to help limit your exposure to food marketing

Next>Reading a Food Label

Read through this convenient handout to learn how to evaluate a food's nutritional quality using the food label.

Class 3-2: Challenges to Eating Well

Guide to Reading Food Labels

Visit the FDA's website to learn "How to Understand and Use the Nutrition Facts Label."

Next>Summary

Class 3-2: Challenges to Eating Well

Summary

Major Points

During today's class, you have learned about:

- Energy homeostasis - the balance between calories consumed and those that are used by the body.
- Types of malnutrition, including undernutrition, overnutrition, and unbalanced nutrition.
- Nutrient and energy density and how knowledge of these factors can be used to make healthier food choices.
- How appetite is regulated.
- Eating disorders including anorexia nervosa, bulimia nervosa, and binge eating disorder and their causes, health effects, and treatments.
- Obesity and how it is defined, its causes, health consequences, ways to prevent and treat it, and the impact on public health.
- Undernutrition and how it is defined, its causes, specific undernutrition syndromes, and the often irreversible effects on children.
- The impact of undernutrition around the world, including richer nations, and public health approaches to treat and prevent undernutrition.
- Food deserts are areas where access to food is limited to due the built environment, social and economic factors, etc.
- Food marketing can impact you in many different ways. It is designed to:
    - create food trends
    - encourage you to:
        - buy certain foods or drinks
        - buy foods in order to get promotional items such as:
            - loyalty points
            - tickets to movies or sports events
            - coupons for future food purchases
        - create links between certain foods or brands and a particular lifestyle
        - build brand loyalty so you will continue to purchase from a particular store or products with a brand name
- How to be aware of food marketing when making food choices
    - Use food labels.

    - Stick to your grocery list and avoid impulse buys.
    - Question why you want to purchase a certain food or drink.
    - Question what form of marketing you got these ideas from.
    - Explore ways to lessen your exposure to ads.
    - Talk with those around you about the effects of marketing.
- Reading Food Labels
    - Serving Size - The serving size is a measured amount of food. Check the serving size on food labels to determine if the number of servings you are eating is smaller or larger. This will help you stay within your daily calorie goal.
    - Calories - The number of calories is the total amount of energy the food provides. Pay attention to calories. If you eat more calories than your body uses, over time you will gain weight.
    - Limit These Nutrients - Americans typically eat too much saturated fat, trans fat, cholesterol, and sodium, which can increase the risk for heart disease, cancer or diabetes.
    - Get Enough of These Nutrients - You should get more fiber, vitamin A, vitamin C, calcium, and iron in your diet. Eating enough of these nutrients can reduce your risk for certain cancers, osteoporosis or hypertension. It is recommended to consume 100% of each of these nutrients daily to prevent nutrition-related diseases.
    - Percent Daily Value - Understanding the Percent Daily Values (% DV) on a food label can help you choose foods high in good nutrients and low in bad nutrients. Choose foods with a low % DV for fat, saturated fat, trans fat, cholesterol, or sodium.