



The Nervous System and Mental Health

Announcements and Reminders

- The final quiz only covers **homeroom presentations**
 - In your “Student Pages” (which were sent via email) you will find the link where we post all homeroom presentations
- Make sure you check in with a preceptor at each elective you attend
- To be eligible for honors, you must:
 - Attend at least 3 electives
 - Have at most 1 absence from homeroom
 - Score in the top 1/3 of the class on the final quiz

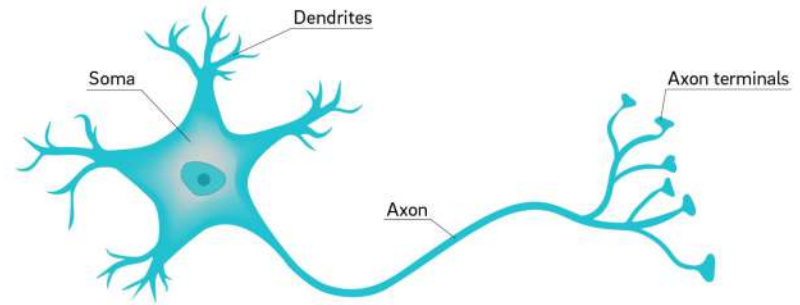
What does the Nervous System Do?



- A collection of cells that transmit messages throughout the body via electrical signals
- These electrical signals control things like
 - Muscle movement
 - Sensation (sight, smell, touch, taste, hearing)
 - Thinking, memory, and emotion

Neurons are the Functional Cells in the Nervous System

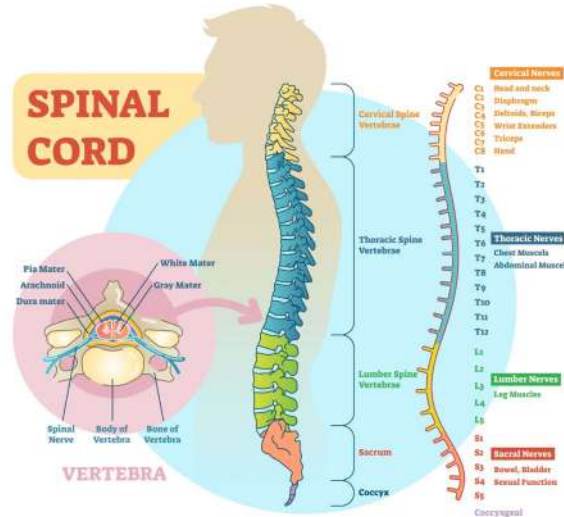
- **Neurons** are specialized cells that transmit electric signals throughout the nervous system
- The electric signals are called **Action Potentials**
- Action potentials travel down the **axon** to the axon terminals
- At the axon terminals, the neuron connects and transmits the message to other cells
 - Cell to cell communication in the nervous system is through the release of molecules called **neurotransmitters** from axon terminals



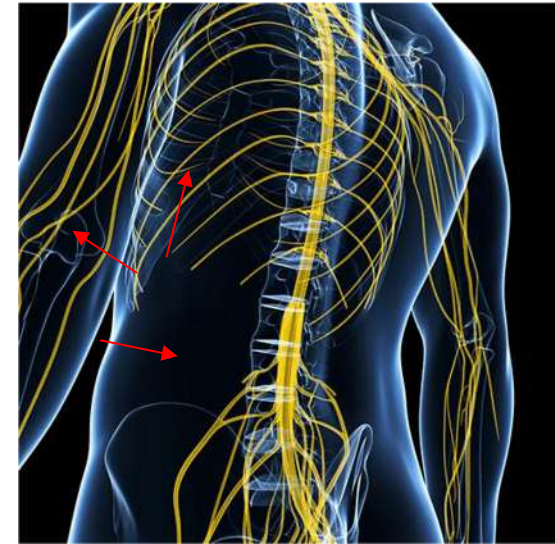
What are the different “parts” of the Nervous System?



Brain



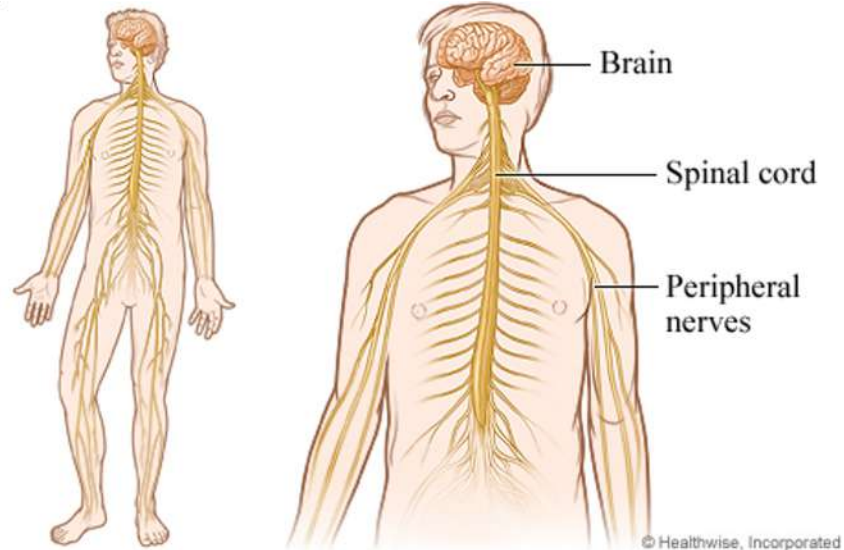
Spinal Cord



Nerves

The Brain, Spinal Cord, and Nerves

- The **brain** is the center of the nervous system.
 - Processes signals coming into it
 - Controls the rest of the body by sending signals out of it (down the spinal cord)
- The **spinal cord** allows electrical signals to be transmitted up and down the body (to and from the brain)
- **Spinal nerves** (bundles of axons) jut out from the spinal cord to the periphery of the body and transmit signals to and from the spinal cord

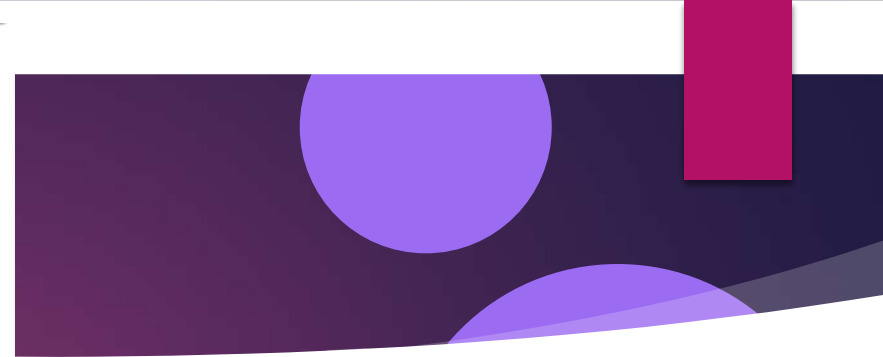


Question 1: Which of the following is NOT a direct function of the nervous system?

- A) Coordinating muscle movements
- B) Absorption of nutrients from the diet
- C) Storage of memory
- D) Processing of visual input
- E) Processing of tactile (touch) input

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What is Mental
Illness?

Can you name any
Mental Illnesses?



Official Definition:

Mental Illness: a wide range of mental health conditions — disorders that affect your mood, thinking and behavior

Is there a link between the brain and mental illness?





YES!!!

*“Researchers studying mental illness believe that **abnormalities in how particular brain circuits function contribute to the development of many mental illnesses.** Connections between nerve cells along certain pathways or circuits in the brain can lead to problems with how the brain processes information and may result in abnormal mood, thinking, perception, or behavior.”*

- Mental illnesses, just like other illnesses, have a physiological cause
- Because mental illnesses have physiological causes, you cannot just “snap out of” a mental illness

Mental Illness in America

- ▶ **1 in 5 Adults in the U.S. experience mental illness each year**
- ▶ Mental illness affects everyone regardless of race, ethnicity, gender, or sexual orientation
- ▶ **1 in every 5 children ages 13-18 in America experiences or will experience mental illness**

Depression is the **leading cause of disability worldwide** and a major contributor to the global burden of disease

- ▶ There are often long delays between appearance of first symptoms and when people get help (sometimes decades)
 - ▶ This is partly due to the stigma associated with mental illness

Treatment in America



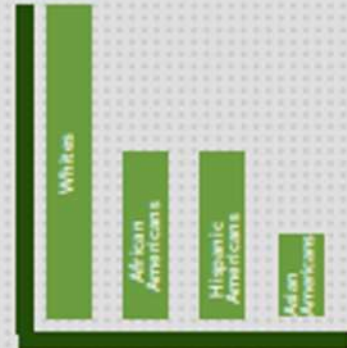
60%

Nearly 60% of adults with a mental illness didn't receive mental health services in the previous year.⁴



50%

Nearly 50% of youth aged 8-15 didn't receive mental health services in the previous year.¹



African American & Hispanic Americans used mental health services at about 1/2 the rate of whites in the past year and Asian Americans at about 1/3 the rate.¹

Mental Illness Treatment in America

Consequences of Lack of Treatment



Difficulty adjusting to society:

26% of homeless adults live with serious mental illness
20% of state prisoners have a “recent” mental health condition
70% of youth in juvenile justice systems affected



Individuals living with serious mental illness face **increased risk of chronic medical conditions**



Higher drop out rates for affected students, with highest dropout rate of *any* disability group



Suicide = 10th leading cause of death in US, **2nd leading cause of death for people aged 10-34**

90% of those who die by suicide have underlying mental illness

Major Depressive Disorder (Depression)

- A common and serious medical illness that negatively affects how you feel, the way you think, and how you act.
- Causes feelings of sadness and/or a loss of interest in activities you once enjoyed
- Can lead to a variety of emotional and physical problems and can decrease your ability to function at work and at home



Possible Clinical Presentations of Depression

Depressed mood and the “SIG-E-CAPS” symptoms

- **S**leep disturbance
- **I**nterest (reduced interest in activities you once enjoyed)
- **G**uilt (feelings of worthlessness and regret)
- **E**nergy loss and fatigue
- **C**oncentration problems
- **A**ppetite changes
- **P**sychomotor agitation or retardation (too much or too little movement)
- **S**uicidality

Depression: Myths and Misconceptions



Myth #1: Depression and sadness are the same.

- **Sadness is fleeting and temporary, but depression is severe and persistent**



Myth #2: Depression isn't a real medical illness.

- In depression there are **physical differences in the brain** that cause the illness.
- **“Serotonin Hypothesis of Depression”** - Depression is (partly) due to a lack of serotonin, a neurotransmitter



Myth #3: Depression is a sign of mental weakness.

- It is not mental weakness. There is a physiological cause
- **No one chooses to develop depression**



Myth #4: Depression “goes away by itself”.

- **Depression requires ongoing treatment and support and will not go away by itself.**

What to do if: someone tells you they are depressed

- ▶ Learn about depression
- ▶ Listen with an open mind
- ▶ Help them get help
- ▶ Stay connected.
- ▶ Reach out to a trusted adult/professional
 - ▶ A trusted adult may be more capable of connecting your friend with services they may need. *Always reach out to an adult/911 if someone is talking about suicide as this is an emergency and requires immediate help.*

What to do if: you are depressed

- **Seek out social support:**
 - Confide in a trusted family member, friend, or adult, or attend a depression support group
- **Speak to your doctor:**
 - Your primary care doctor may prescribe you medication and/or refer you to therapy
- **Go to therapy:**
 - Therapy is a treatment for depression in which you talk about your condition with a mental health professional.
 - Therapy can be provided by:
 - A psychiatrist - a medical doctor who can prescribe medications
 - A psychologist - a professional with a PhD in psychology who can't prescribe medications in most states
 - Various other mental health professionals/counselors
- **Make healthy lifestyle changes:**
 - Eating healthier and exercising more can help some people find relief from the symptoms of depression.



Question 2:
What is a Major Clinical Sign of Depression?

- A) Mood Swings
- B) Energy loss and fatigue
- C) Episodes of intense fear and worry
- D) Moments of happiness followed by sadness
- E) None of the above



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Anxiety Disorders



Characterized by **excessive fear and/or anxiety** on most days lasting for **at least 6 months** and adversely affecting the patient's life



Some anxiety disorders include:

- **generalized anxiety disorder (GAD)**
- **agoraphobia**
- **social anxiety disorder**
- **post-traumatic stress disorder (PTSD)**
- **obsessive-compulsive disorder (OCD)**



Affects 18.1% (42 million) of Americans



An estimated 31.9% of adolescents had an anxiety disorder (NIH)

GAD: Myths and Misconceptions

Myth #1: Generalized Anxiety Disorder is not a “real” illness.

- Almost everyone experiences anxiety at some point
- But generalized anxiety disorder causes **excessive or unrealistic anxiety and worry** — well beyond what's appropriate for a situation


Myth #2: Someone with an anxiety disorder should avoid situations that cause stress.

- Avoidance of the situations that cause anxiety just reinforces the anxiety disorder
- **Effective anxiety treatment involves gradually and safely exposing you to the source of your anxiety so that you can learn to cope with it, not avoid it.**

Bipolar Disorder

- Condition that causes extreme mood swings that alternate between emotional highs (manic episodes) and lows (depressive episodes)
- Moods can shift from hopelessness and no interest to extreme joy and full of energy
- Can affect person's judgement and sleep
- Amount of bipolar episodes a person has depends on the individual (can happen a often in a year or barely at all)





Question 3: It is Monday and it is finals week at John's high school. He has 2 finals on Tuesday, 2 on Wednesday, and 2 on Thursday. He has not begun studying for any of them. John is feeling extremely anxious. Based on this information alone, are you worried his anxiety is a symptom of a larger anxiety disorder?


- A) Yes
- B) No

Question 3

A) Yes

B) No

We do not know much about John, so it is hard to say for sure. But **there does seem to be a reasonable reason why he is experiencing this anxiety**, so this alone does not raise suspicions for an anxiety disorder. If you were to take a patient history and he mentions he persistently feels anxious, this would raise suspicions.



How does social
stigma prevent people
from seeking care?

Social Stigma

- ▶ Stigmas are defined as “***stereotypes or negative views*** attributed to a person or groups of people when their characteristics/behaviors are viewed as ***different from ... societal norms***”
- ▶ Common Stigmas:
 - ▶ People with mental illness are dangerous and unpredictable
 - ▶ Self-stigma arises in patients where they believe they are undeserving of care or dangerous
 - ▶ Structural stigma can be seen in the lack of insurance coverage for mental care compared to many other types of health care
- ▶ **Stigma and discrimination against patients and families prevent people from seeking mental health care due to feelings of shame and inadequacy**
 - ▶ Can lead to abuse, rejection and isolation, and can exclude people from health care or support.

What is mental health?

“Mental health is defined as a **state of well-being** in which every individual realizes his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to her or his community.”

- *World Health Organization*

Promote Good Mental Health

1. Value yourself
2. Take care of your body (eat nutritious meals, drink water, exercise, and get enough **sleep**)
3. Surround yourself with good people
4. Give yourself in service of others (e.g. volunteer, help someone in need)
5. Learn how to deal with stress (e.g. Tai chi, yoga, writing, playing with a pet)
6. Quiet your mind (e.g. meditation, mindfulness)
7. Set realistic goals
8. Avoid alcohol and other drugs (avoid self medicating)
9. **Get help when you need it**

Important Numbers to Write Down!!!

- National Suicide Prevention Lifeline: 1-800-273-TALK (8255)
- Crisis Text Line: Text “home” to 741741
- Substance Abuse and Mental Health Services Administration (SAMHSA) National Helpline: 1-800-662-HELP (4357)
- National Alliance on Mental Illness (NAMI) Helpline: 1-800-950-NAMI (6264)

- If you feel that you have a mental illness, please reach out to a trusted adult or a doctor

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QUESTIONS?

References

- <https://www.apa.org/depression-guideline/case-examples>
- <https://www.psychiatry.org/patients-families/depression/what-is-depression>
- <https://www.mayoclinic.org/diseases-conditions/depression/in-depth/depression/art-20045943>
- <https://www.sapnamed.com/blog/10-surprising-facts-about-the-spinal-cord/>
- <https://www.mayoclinic.org/diseases-conditions/mental-illness/symptoms-causes/syc-20374968>
- <https://www.mayoclinic.org/diseases-conditions/bipolar-disorder/symptoms-causes/syc-20355955>