BRAIN on

DRUGs 101

GATEWAY

TRENDS

Marketing

Recognition

2012

LT. Ed Moses, Retired

Objectives

- List types and effects of Depressant abuse {#28-34 DEA}
- List types and effects of Stimulant abuse {#35-46 DEA}
- List types and effects of Hallucinogen abuse {#47-55}
- Recite parts of the brain and their functions {#7, 11 Dr. John Duncan, OK U.}

Introduction

target organ of drugs – **The BRAIN**.

As the brain changes, so does our world –things look different, have differing significance, and we see ourselves differently. Our **behavior becomes altered** to match the change in conscious life. **Drugs alter the brain**, therefore, altering conscious life.
We are our brains,
we change our life with drugs.

ONLY GREAT MINDS CAN READ THIS

fi yuo cna raed tihs, yuo hvae a sgtrane mnid too

Cna yuo raed tihs? Olny 55 plepoe out of 100 can.

i cdnuolt blveiee taht I cluod aulaclty uesdnatnrd waht I was rdanieg. The phaonmneal pweor of the hmuan mnid, aoccdrnig to a rscheearch at Cmabrigde Uinervtisy, it dseno't mtaetr in waht oerdr the ltteres in a wrod are, the olny iproamtnt tihng is taht the frsit and lsat ltteer be in the rghit pclae. The rset can be a taotl mses and you can sitll raed it whotuit a pboerlm. Tihs is bcuseae the huamn mnid deos not raed ervey lteter by istlef, but the wrod as a wlohe. Azanmig huh**? yaeh and I awlyas tghuhot slpeling was ipmorantt!**

In 5 seconds how many **RED** items can you memorize?

Bad Choice* = *Bad Consequences

Unrecognized

by the individual & Society

"This is your brain on drugs." by Dr. Carrie John '08 University of Maryland School of Medicine doctorate in physiology and pharmacology Paper: acute and neurotoxic effects of psychostimulants

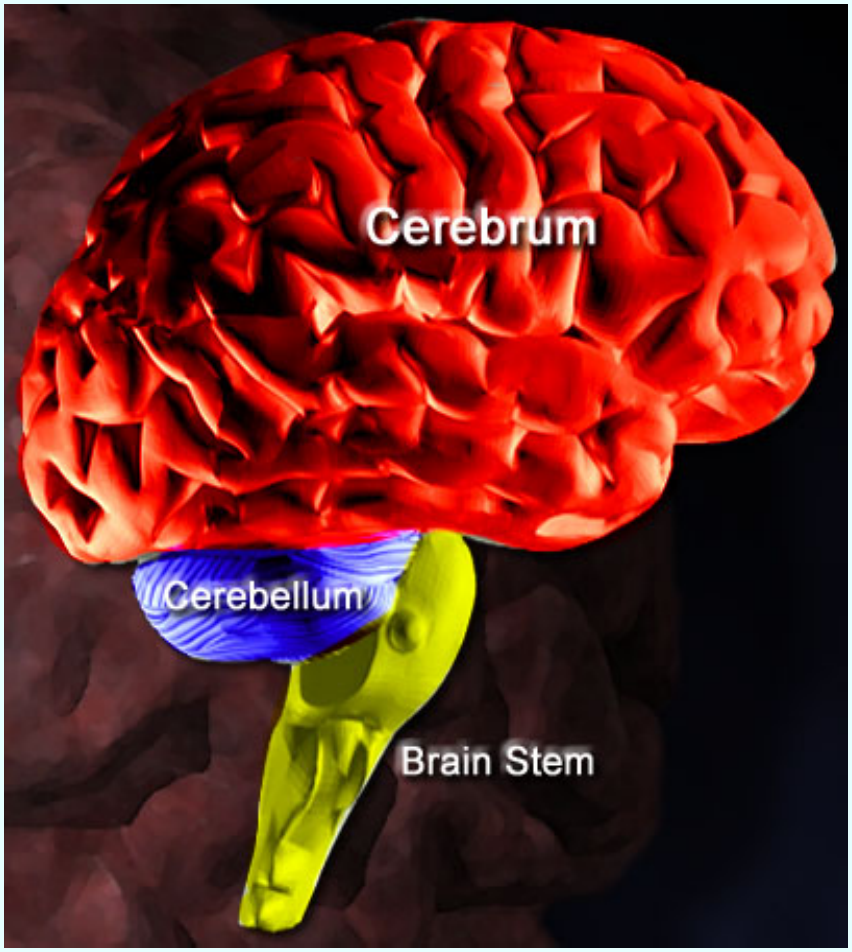
Friend: Dr. Clinton McCracken, expertise is addiction and compulsive behaviors

- Dr. John died 9/27/09 OD on **buprenorphine**, a narcotic known on the street as "bupe" and commonly used to treat heroin addiction due to being safer than methadone, black market **bupe** is usually mixed with some kind of tranquilizer and injected.
- In couple's **unkempt** residence were large quantity of **drugs**, **pills**,"**huge gardens" of marijuana** w/elaborate lighting system and more that **20 bongs** in all shapes, sizes and configurations strewn abut the home
- Drugs buprenorphine, morphine, OxyContin, and marijuana reportedly came from an online pharmacy in the **Philippines**
- Baltimore police said ironic that **"two pharmacy Ph.D.s** were ordering drugs from an **online pharmacy"** overseas
- [NOTE: ***No matter how smart, well educated, clever, physically strong * abuse will do what science dictates not what one thinks about the drug]***

Source: Baltimoresun.com by Nick Madigan

Three Main Parts

- Cerebrum
  - **THINKING**
- Cerebellum
  - **Balance/posture**
- Brain Stem
  - Motor/Sensory/**VITALS**



NOTE:

Each is further divided into regions that control specific functions

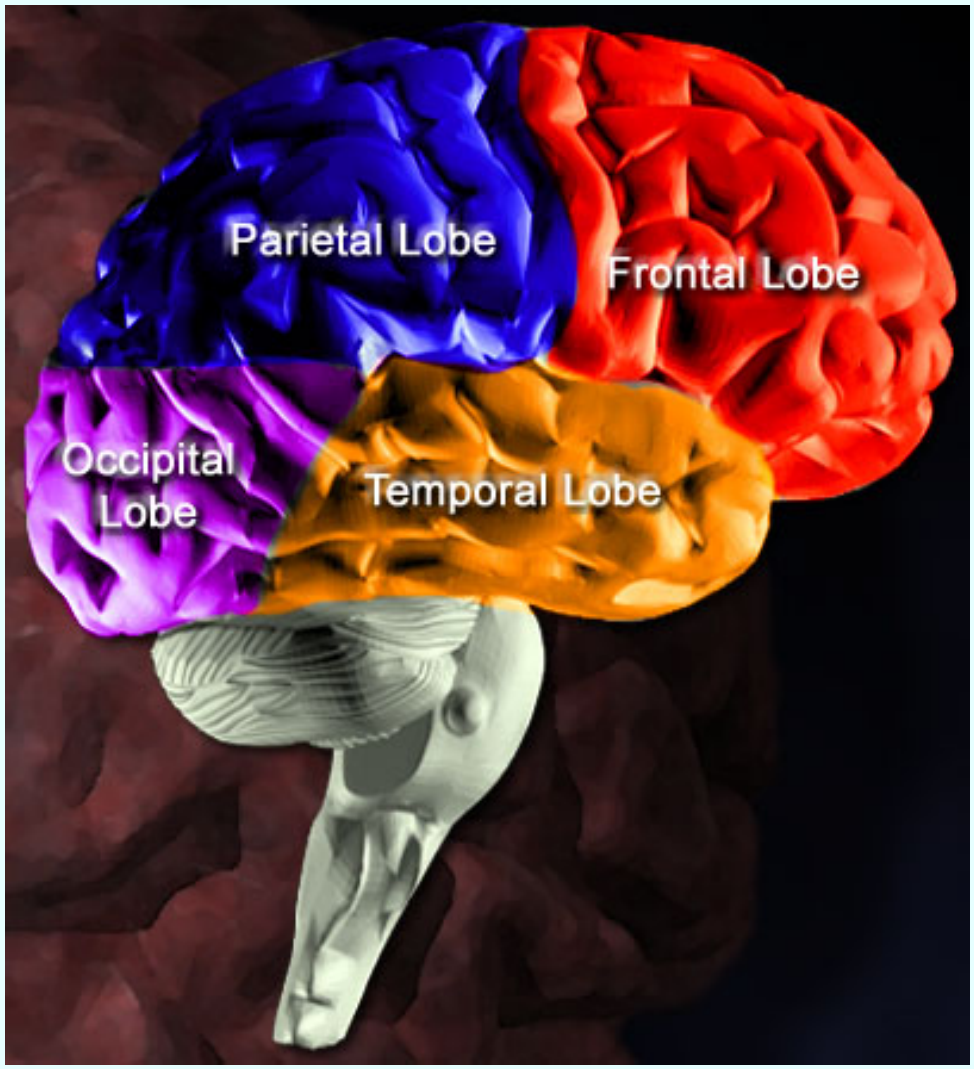
7

Three Main Parts

- To accommodate the skull the cortex is folded forming –
  - Folds (gyri)
  - Grooves (sulci)
- Several large sulci divide the cortex into lobes –
  - Frontal lobe
  - Parietal lobe
  - Occipital lobe
  - Temporal lobe

Note: Each has a different function

Cerebrum

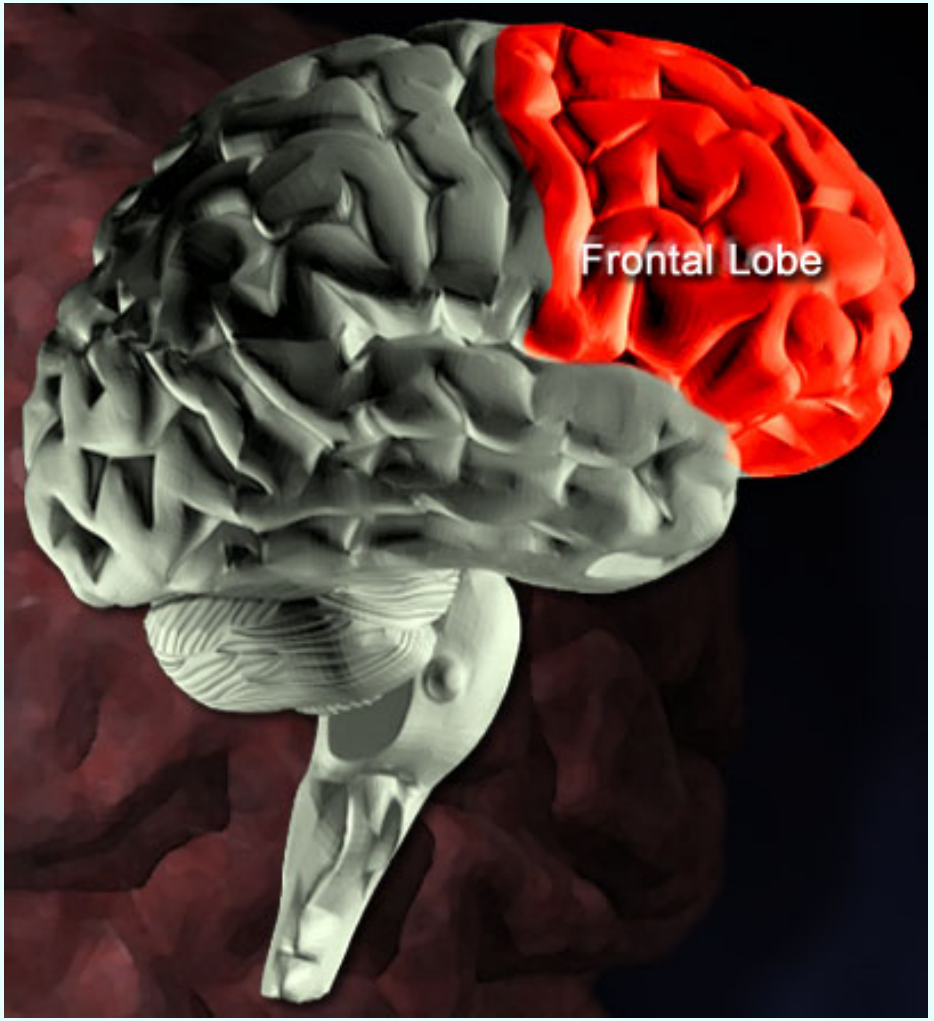


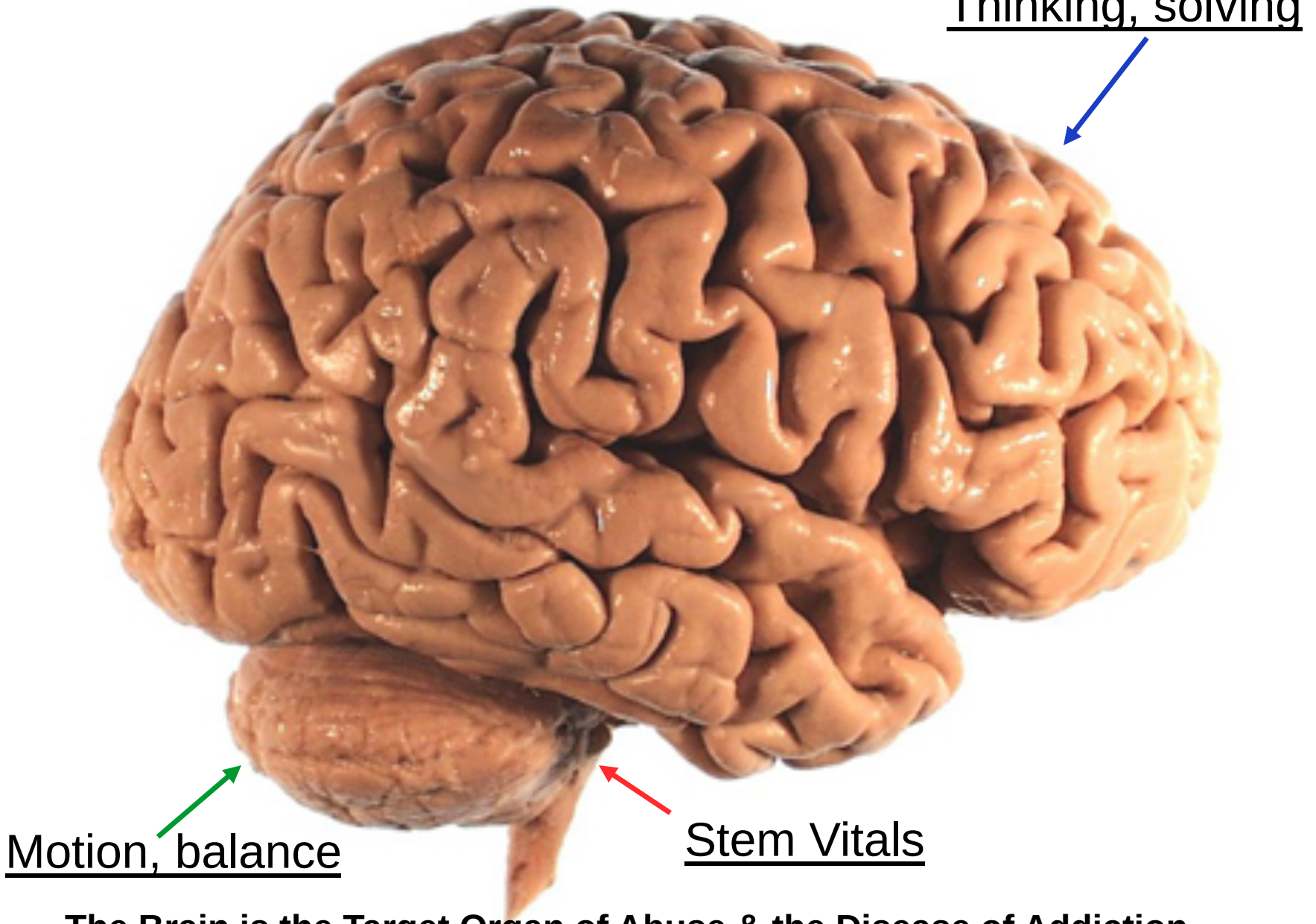
Three Main Parts

Cerebrum – Frontal Lobe

Frontal Lobe Functions:

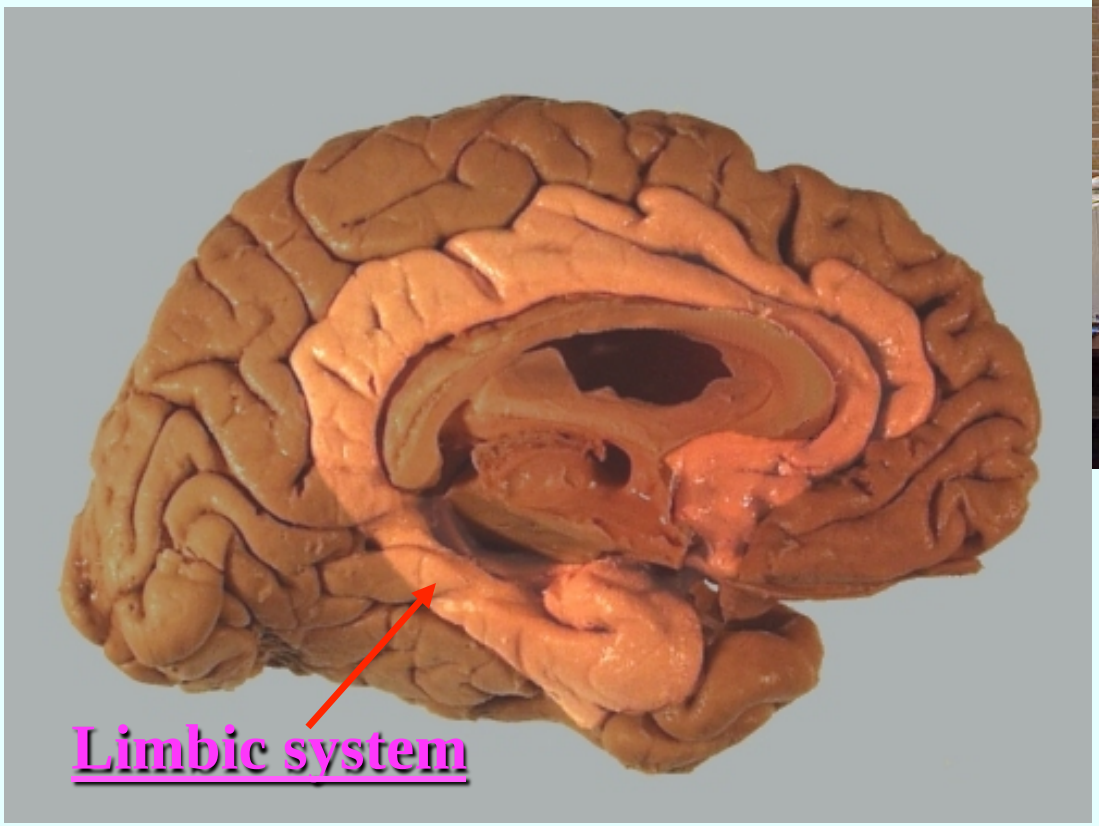
- **Behavior**
- Abstract thought processes
- **Problem solving**
- **Attention**
- Creative thought
- Some emotion
- Intellect
- Reflection
- **Judgment**
- Initiative
- **I N H I B I T I O N**
- Coordination of movements
- Generalized and mass movements
- Some eye movements
- Sense of smell
- Muscle movements
- Skilled movements
- Some motor skills
- Physical reaction
- Libido (sexual urges)

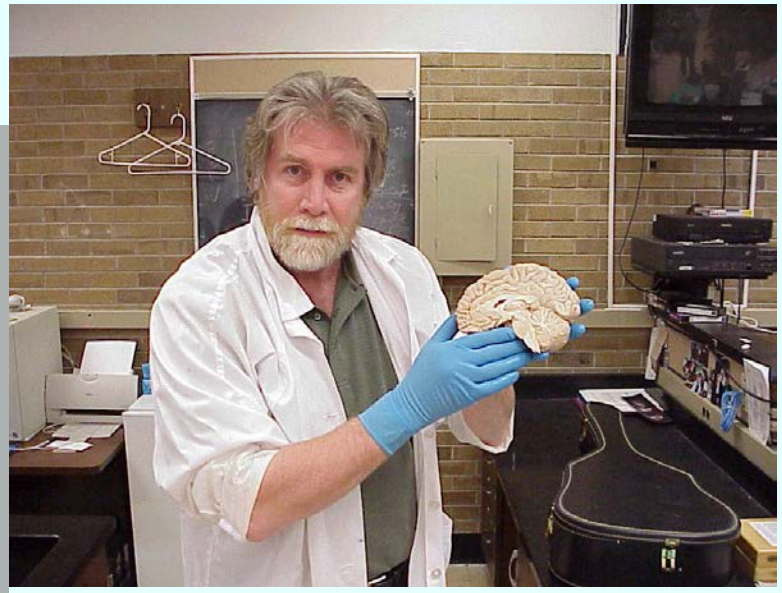




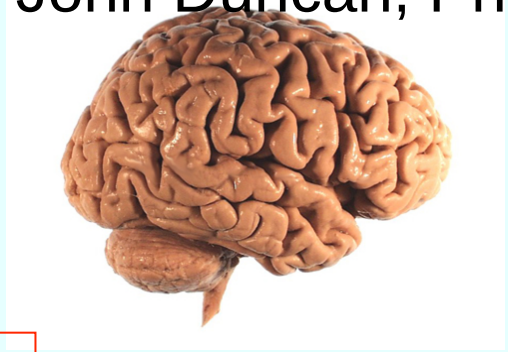
The Brain is the Target Organ of Abuse & the Disease of Addiction

The Amygdala and the Biological Onset of Paranoia



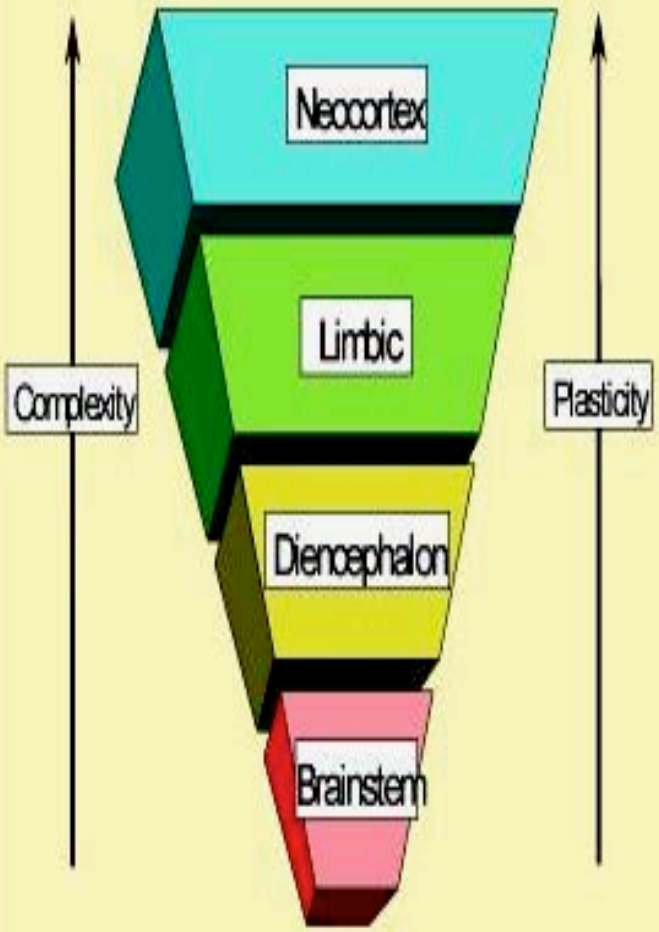


Dr. John Duncan, PhD.



Example of Effects of Brain Damage

Neuroadpatation



Brain Plasticity: The human brain is very plastic - meaning that it is capable of changing in response to patterned, repetitive activation (e.g., reading or hearing a new language, learning a new motor skill such as typing). Recalling, however, that the brain is not just “one” large mass of equivalent tissue - recalling that the brain has a hierarchical and complex organization and that different systems mediate different functions, it stands to reason that not all parts of the brain -once developed - are as easy to modify or change with experience. Simply stated, not all parts of the brain are equally plastic. The plasticity of the cortex is much greater than the plasticity of the brainstem.

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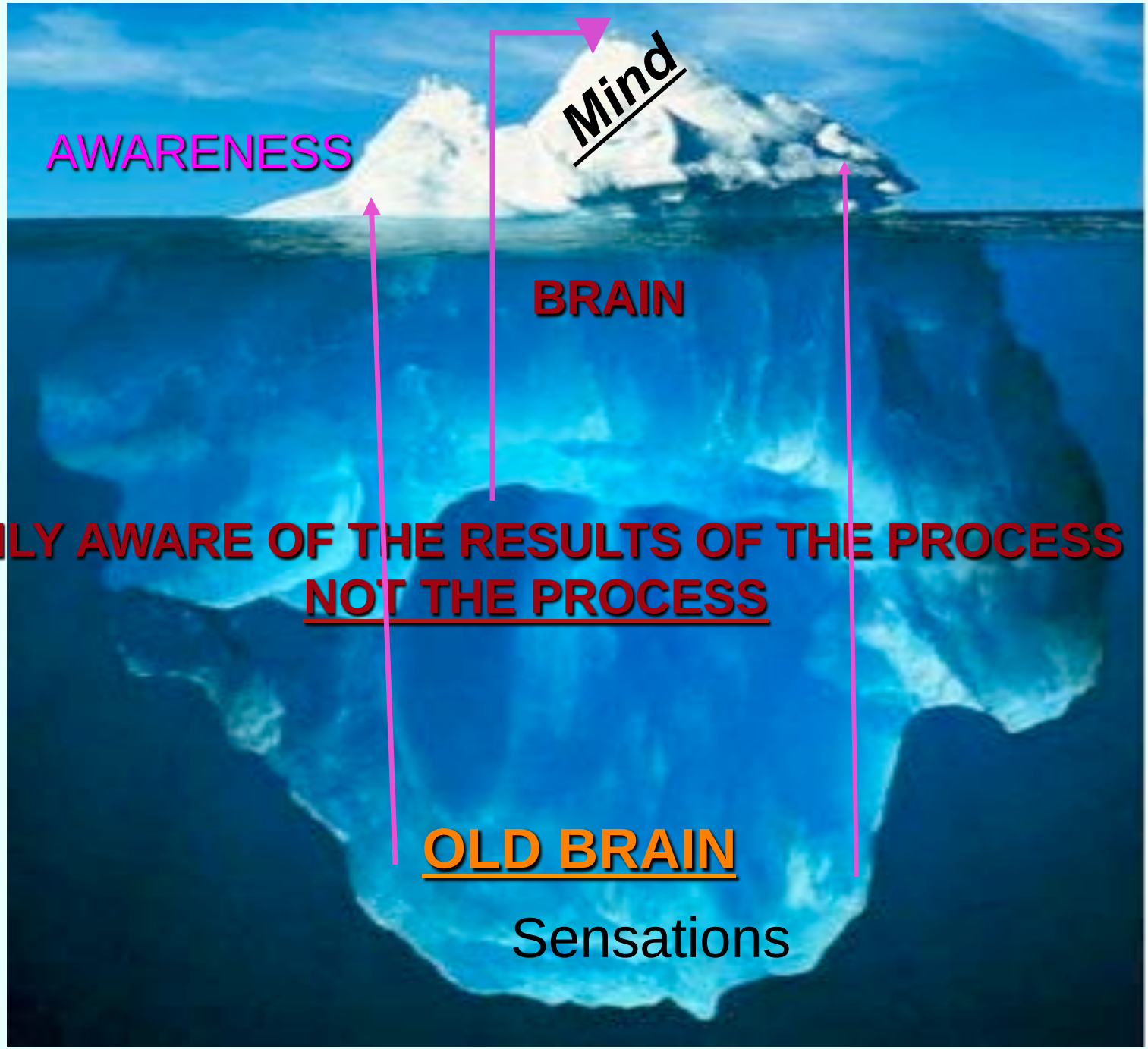
Mind vs. Brain



7 Major Processes < Drug

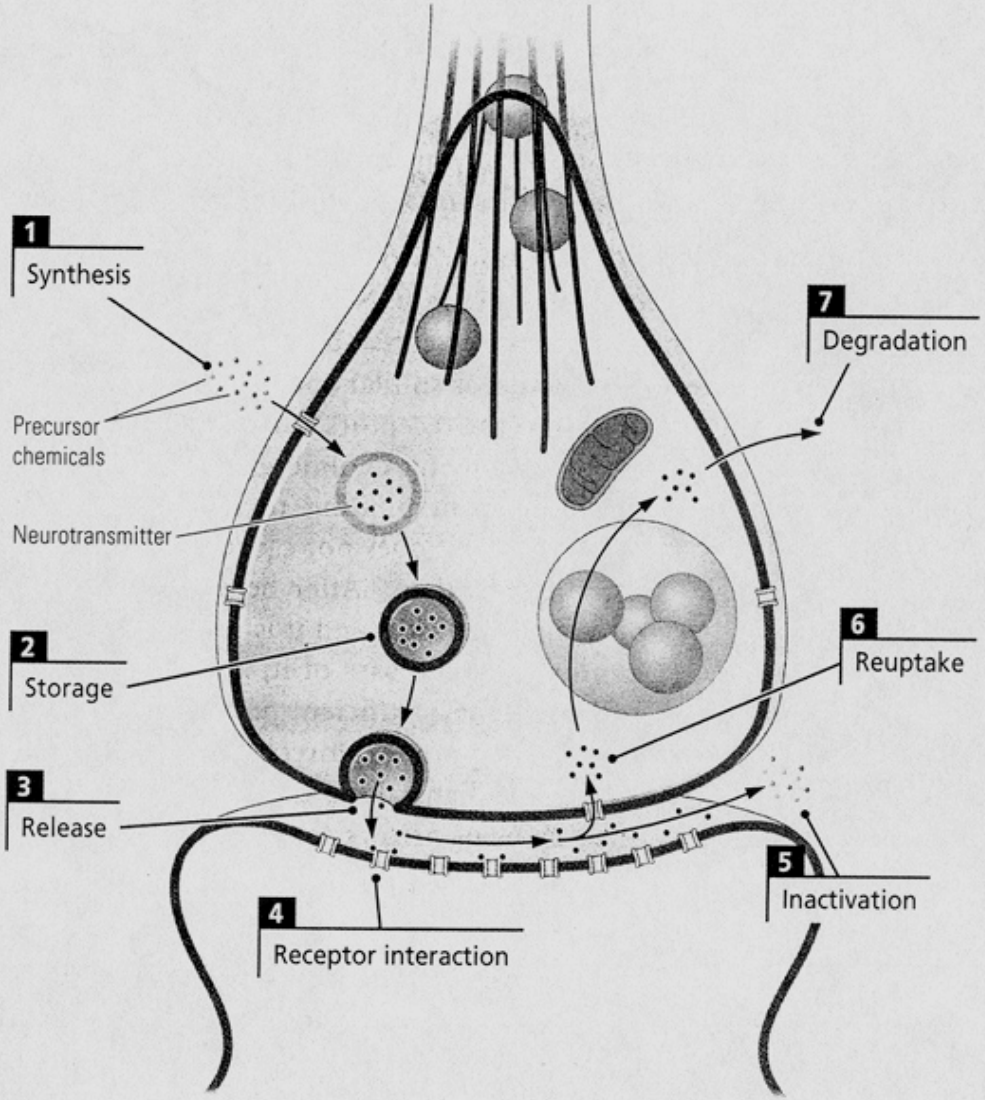
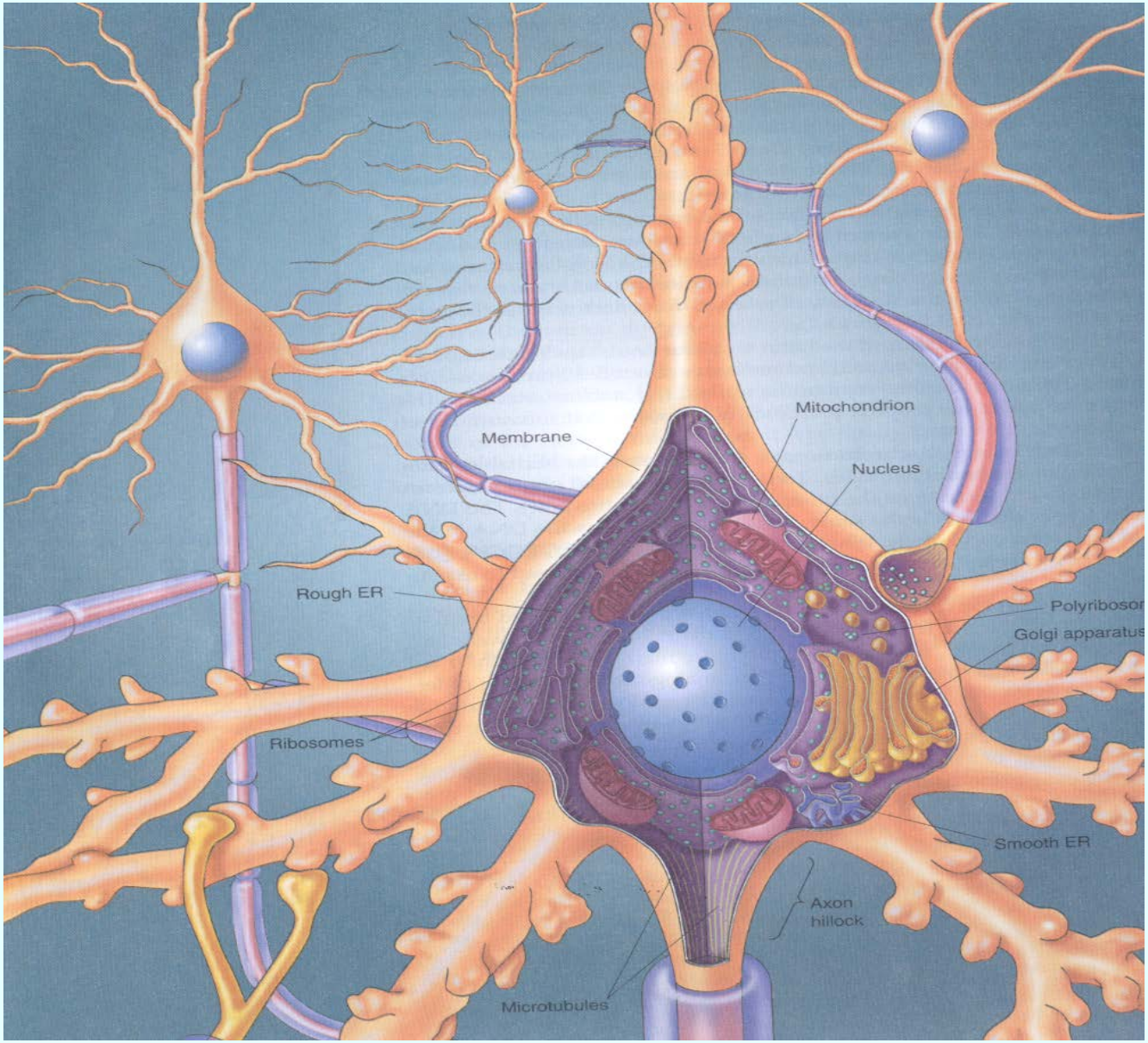


Figure 6-5

Seven major processes that a drug can modify to influence synaptic transmission. In principle, a drug can enhance or block a chemical process at each site, resulting in reduced or enhanced synaptic transmission.

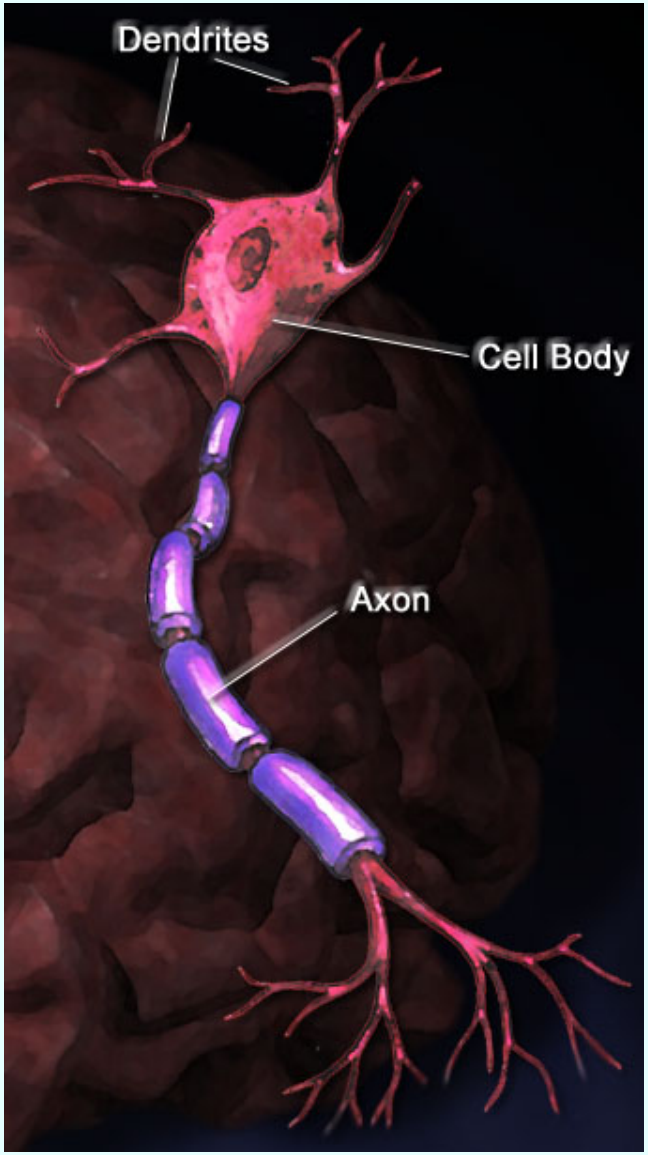
Neuron Architecture



Brain Communication Network

Overview

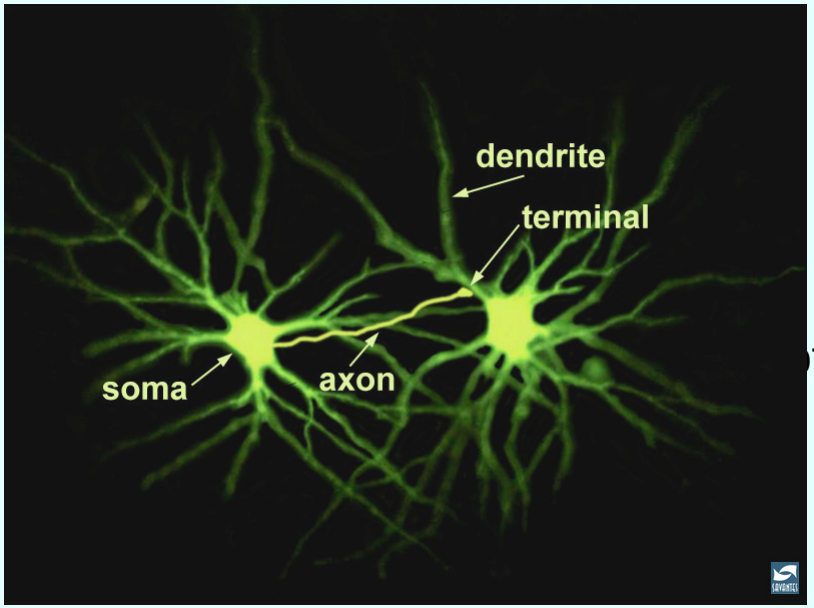
- Brain is made up of a complex network of billions of nerve cells called *neurons,* as well as other kinds of cells.
- Whether awake or sleeping the brain is wake transmitting information across the nervous system highway
- Glucose the brains primary fuel
- Brain produces enough electrical energy to power a 40-watt bulb for 24 hours



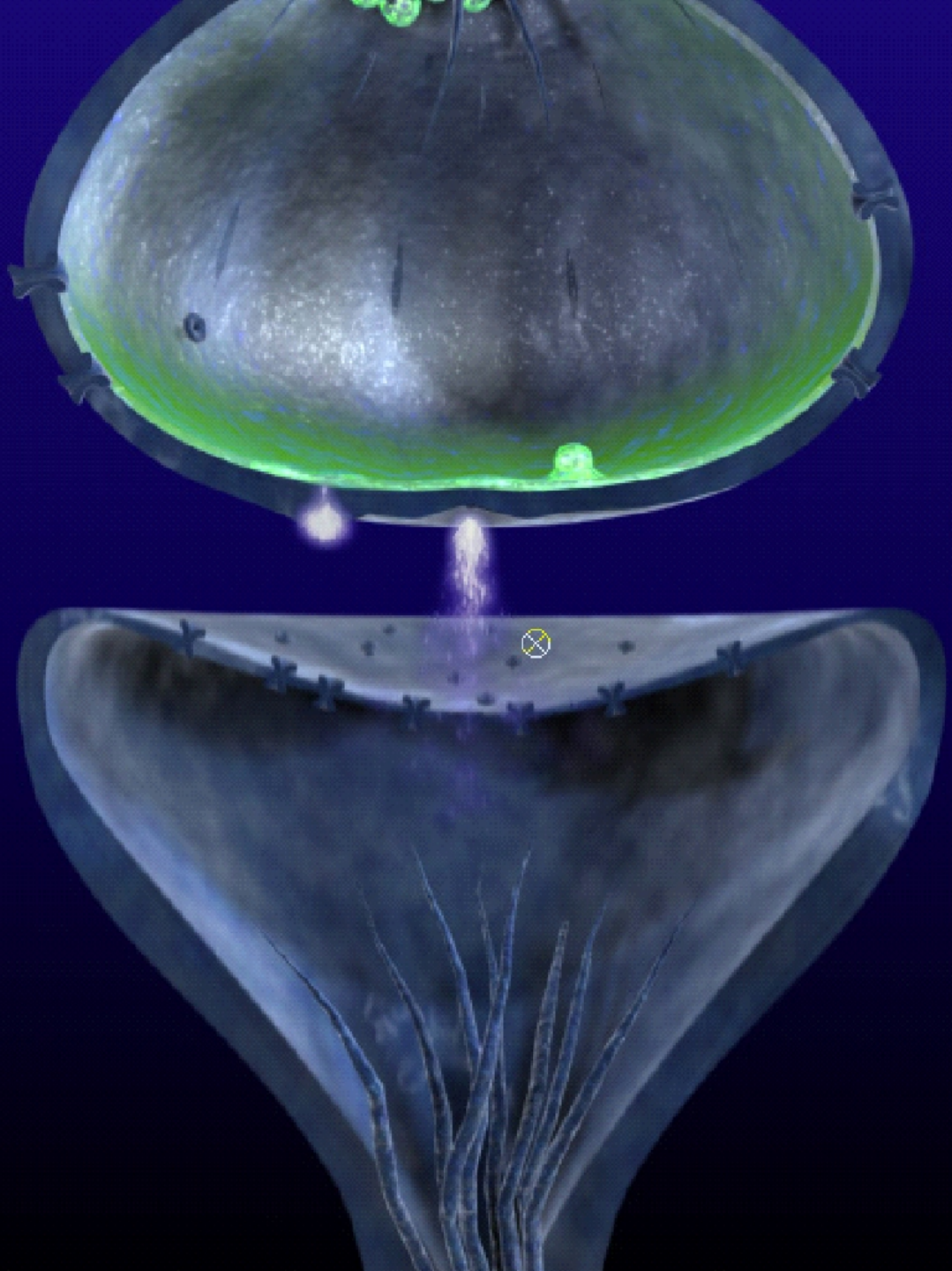
Brain Communication Network

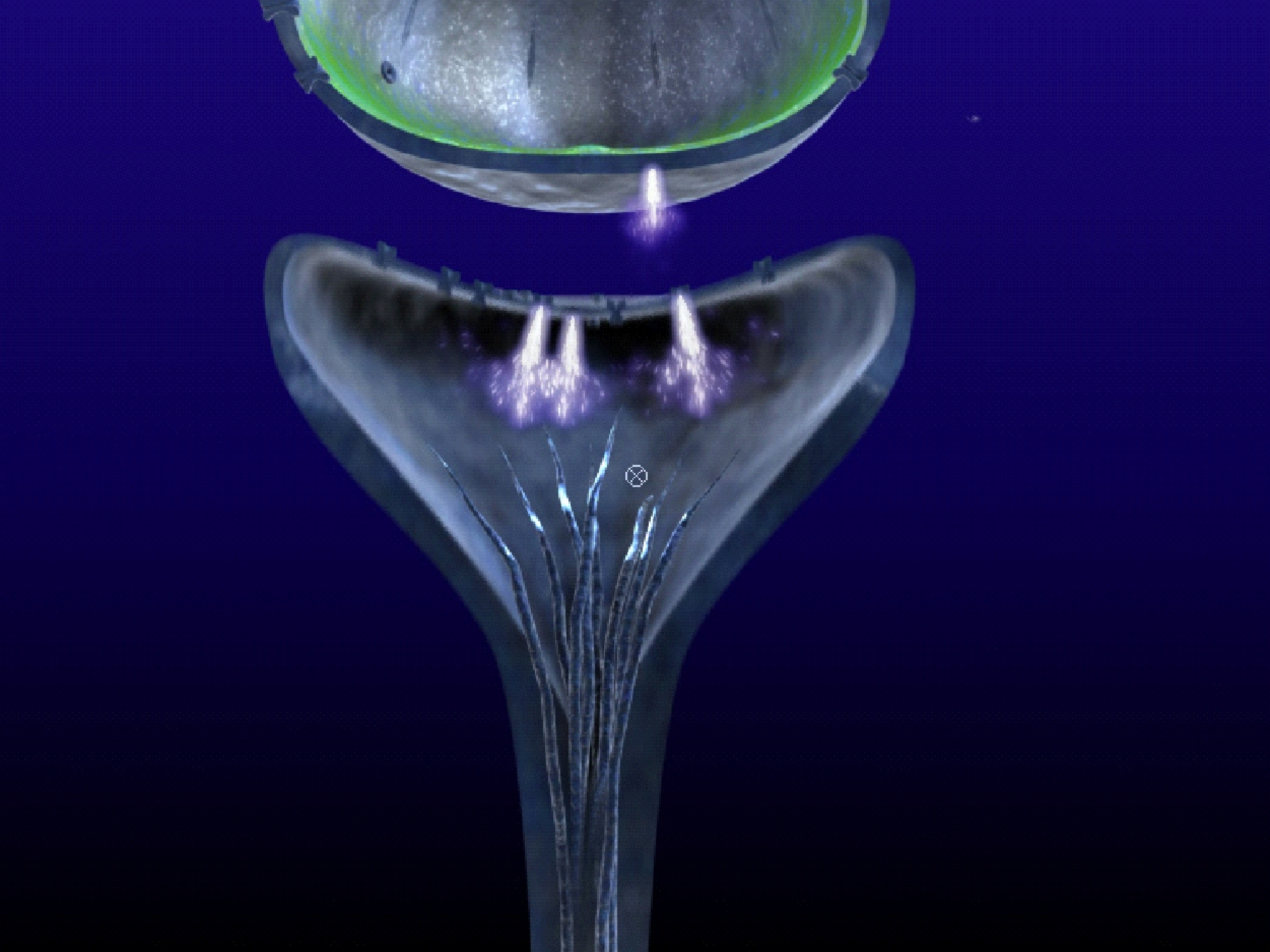
Neurons

- Neurons in the brain and spinal cord are part of the nervous system and act as a body's "Command Central.”

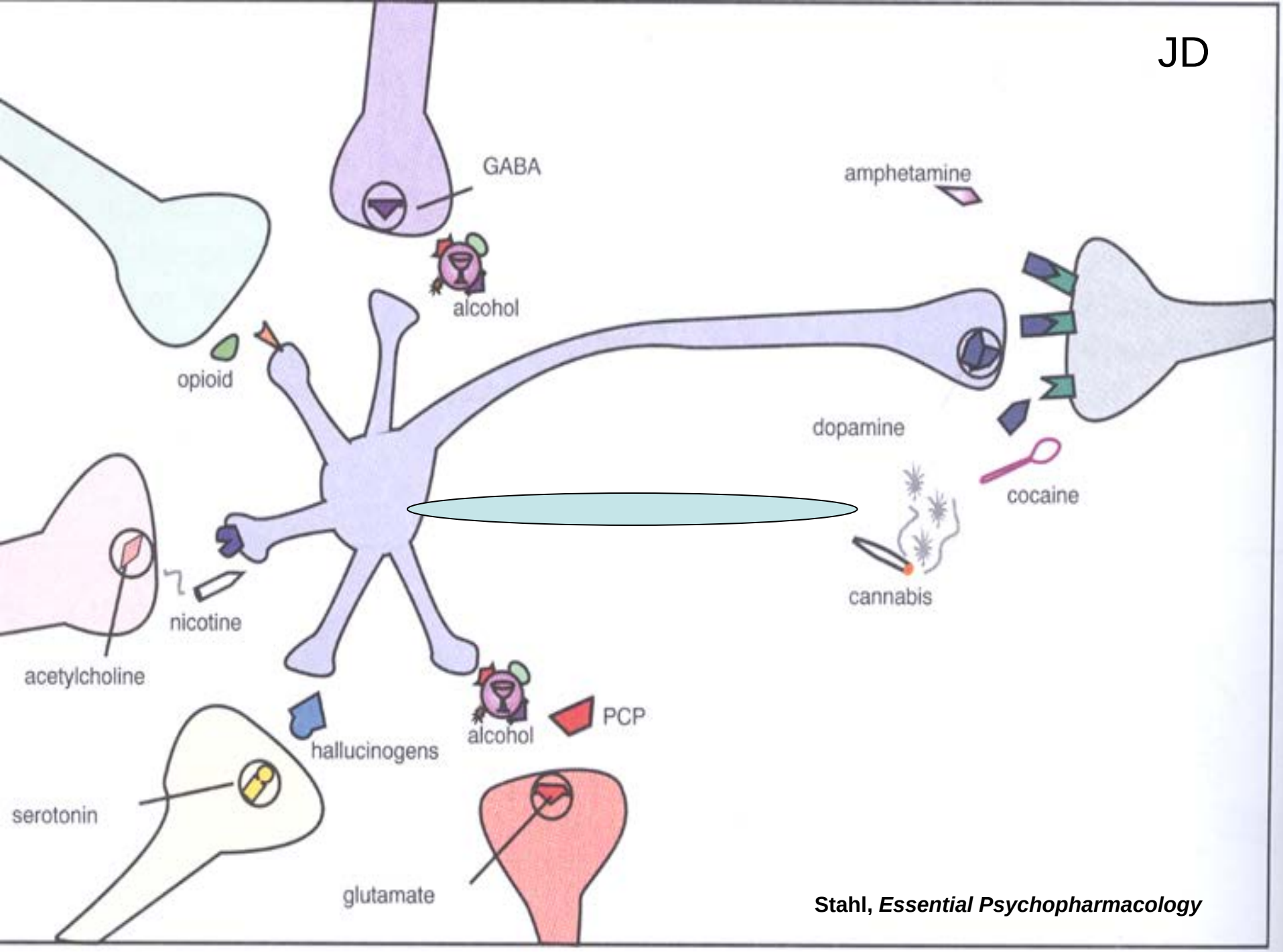


- Send information from the brain throughout the body from one neuron the next until ultimately reaching the organs of the body.
- Neuron also store information as memory
- Neurons contain three important parts:
  - Cell body: Directs all activities of the neuron
  - Dendrites: Short fibers that receive messages from other neurons and relay those messages to the cell body
  - Axon: Long single fiber that transmits messages to from the cell body to dendrites of other neurons
- Transmission is amazingly fast and often compare the activity of neurons to the way electricity works.

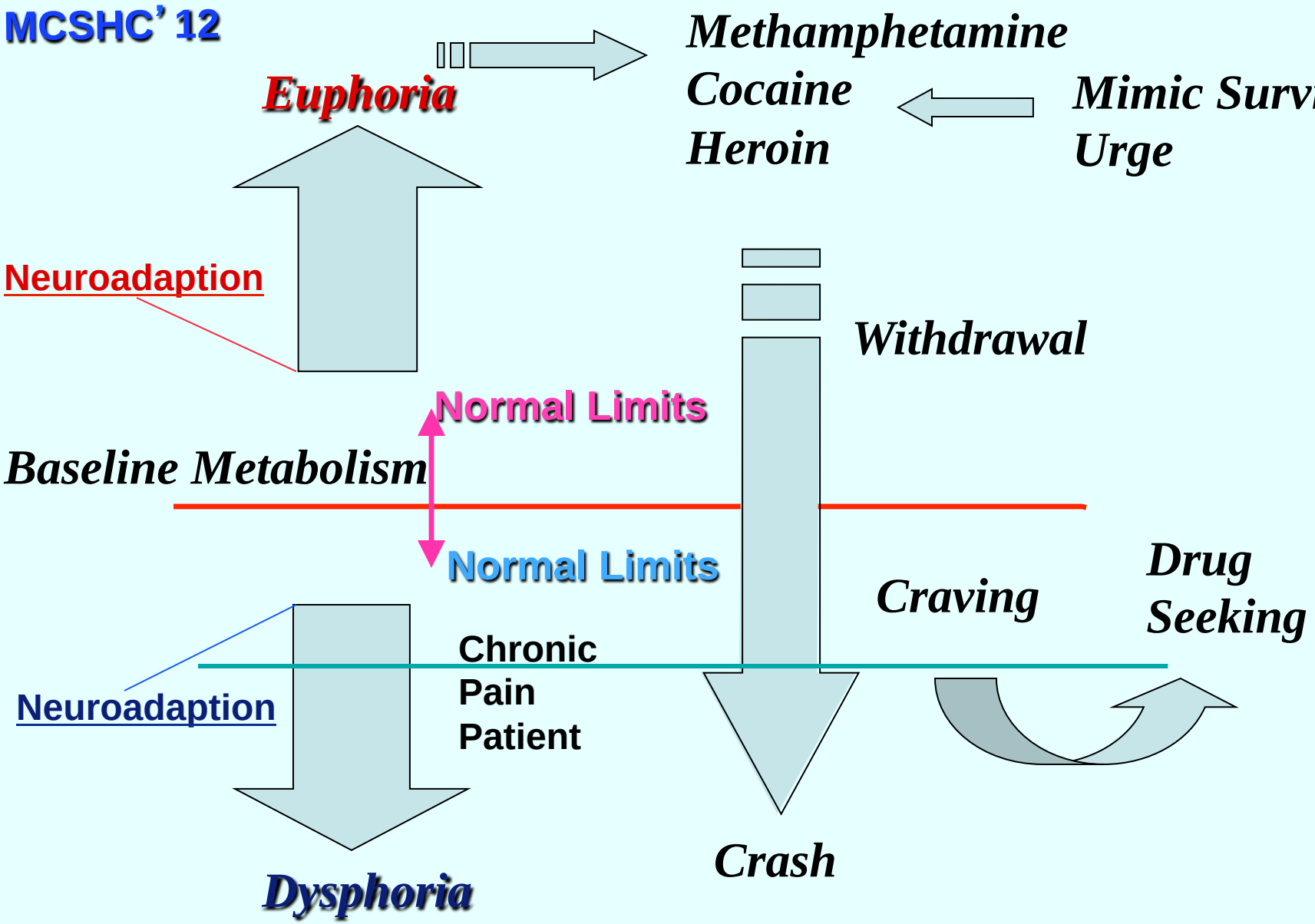




JD



Stahl, *Essential Psychopharmacology*



Cycle of Drug Use Related to Pleasure Chemistry

Introduction

- **3 basic drug categories** mimic natural body chemicals.
- Body cell normal is perfect
- Medical use Vs Street abuse
- Whatever the drug abuser seeks, mentally or physically - **eventually or in withdrawals the effects are basically the opposite AND the negative effects increase while the desired effects decrease.**

HOMEOSTASIS

The process by which the body maintains a **steady state**

The function of the regulatory mechanisms in the body is to maintain a kind of **stability** in all **body systems**

The **hypothalamus** is crucial to this process

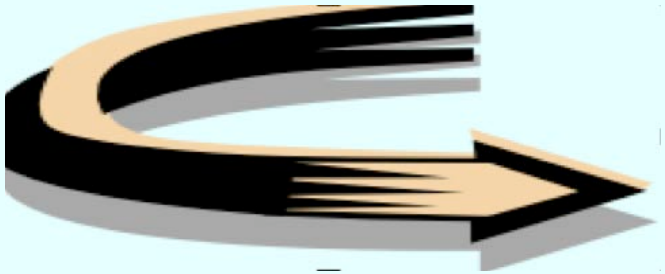
Drug use can ***interfere*** ***&*** ***permanently*** ***damage*** this phenomenon

Tolerance for a Drug
"Chasing the Dragon"

- The same dose of the drug will produce diminishing effects.

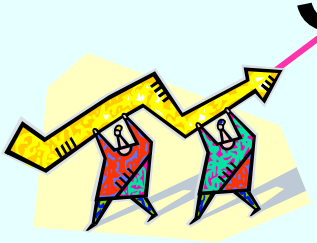
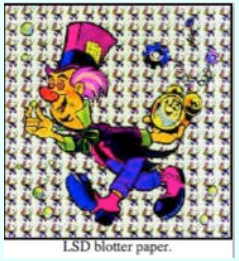
OR

- A steadily larger dose is needed to produce the same effect.



MORE, STRONGER, DIFFERENT

- METHOD OF USE

- Swallowed 
- Snort 
- Shot 
- Smoked 
- Skin 

- Special ?

Substance Abuse Prevention Dollars and Cents: A Cost-Benefit Analysis 3/6/07

- Studies have shown the annual cost of substance abuse to the Nation to be $510.8 billion in
- 1999 (Harwood, 2000). More specifically,

Alcohol abuse = $191.6 billion.

Tobacco use = $167.8 billion.

Drug abuse = $151.4 billion.

- Substance abuse clearly is among the most costly health problems in the United States.

Drugs are categorized into 3 basic groups:

1. Depressants
2. Stimulants
3. Hallucinogens
4. Dissociative Anesthetics
5. Narcotic Analgesics
6. Inhalants
7. Cannabis

In this block you will learn how drugs are **grouped** and their **effects**.

This is your Brain
on Depressants

Just a
Chillin'
With a
Chill Pill

Depressants

They are categorized as either -

– 1. Depressant = Drunk
– 2. Narcotics = An "alert" drunk

- Both produce feeling of euphoria and tranquillity and may be used for pain relief.

- Sedatives induce a state of relaxation or induce sleep

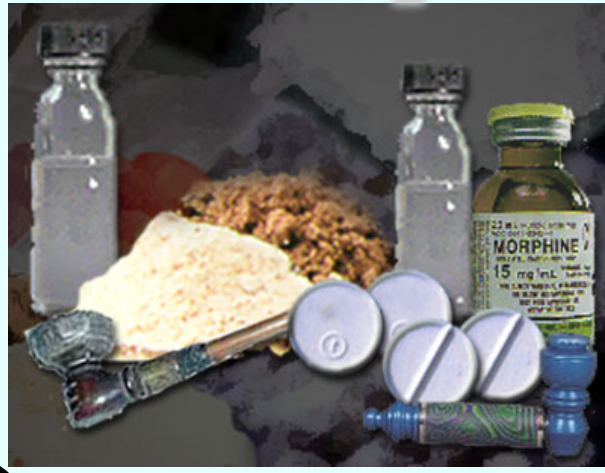
WARNING

Diabetic in trouble = can be similar

Summary

Depressants

?s



DRUNK

DRUGGED

DIABETIC

[* IN TROUBLE]

This is your Brain on Stimulants

Frying Like I’m Dying

$$$ **EUPHORIA** $$$

!@#*! **ANGER** !@#*!

?<?>? **FEAR** ?<?>?

Cyclic

Stimulants

- Stimulants are derived from natural or synthetic substances and chemicals

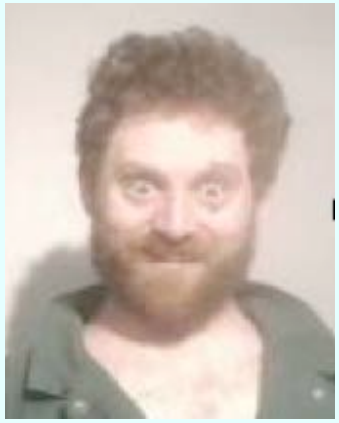
- Stimulants from natural origin include and are not limited to –
  - Nicotine
  - Caffeine
  - Cocaine
  - Ephedra
  - Khat

Stimulants

- Stimulants are also derived from synthetic substances

- Drugs of concern
  - –Amphetamines
  - –Methamphetamine
  - –MDMA - Ecstasy
  - –Methcathinone
  - –Methylphenidate (Ritalin)

***Breaking Bad - amc Premiered Jan 20 '08*



Stimulants

HIGH produces feelings of:

- $$$ ***E U P H O R I A*** $$$
- !@#*! ***A N G E R*** !@#*!
- ?<?>? ***F E A R*** ?<?>?

Stimulants > METHAMPHETAMINE

Cycles of Abuse – Binge Users

- **Experience euphoric rushes that are psychologically addictive**
- **Goes through a cycle that can last weeks**
- **Binge Phase**
  - >>> Rush
  - >>> High
  - >>> Binge
  - ||| Tweaking
  - <<< Crash
  - <<< Normalcy
  - ||| Withdrawal
  - Relapse >>>

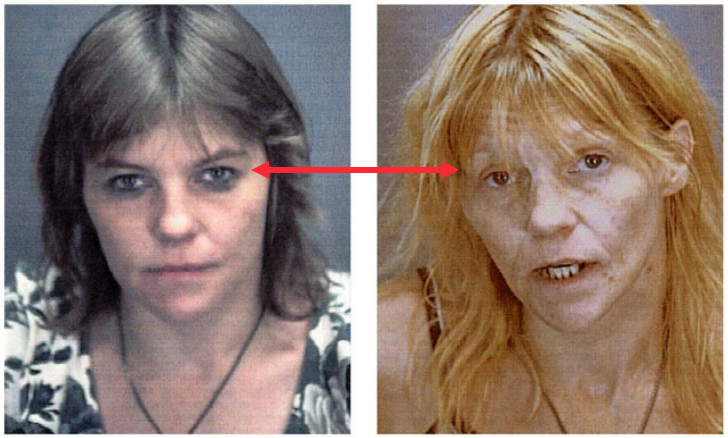
Meth uses up calcium to create its effects –but you are not hungry and do not replenish calcium through diet

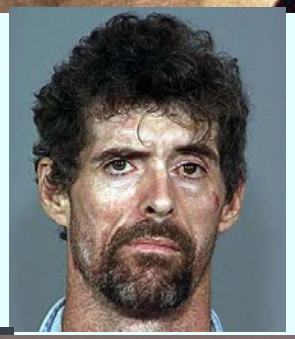
Dental hygiene is Frequently overlooked during meth binges

Loss of Calcium Causes Tooth Decay

Some pull teeth and use dentures to hide effects

JD



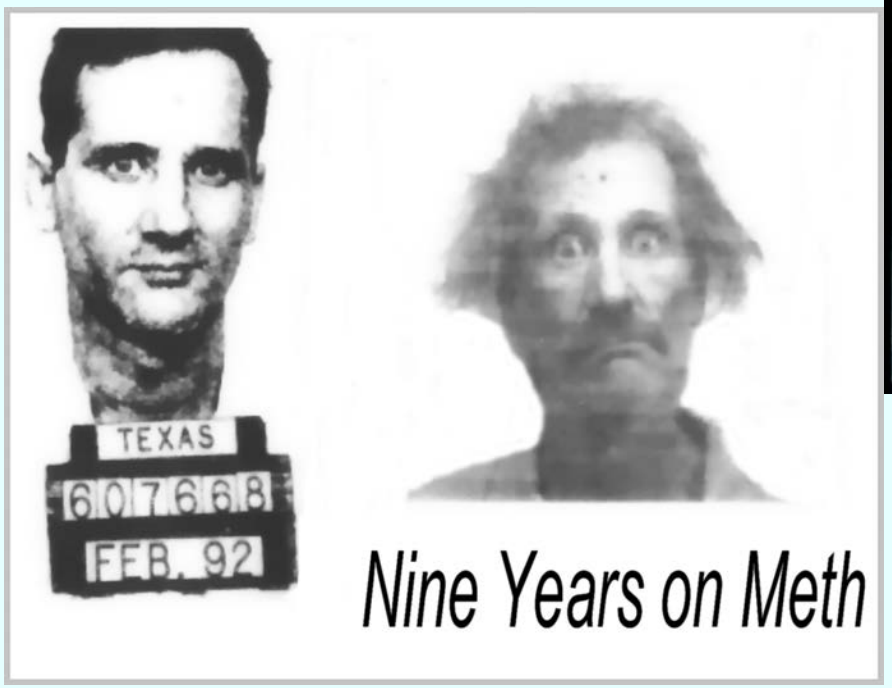


All under five years of chronic meth abuse

JD

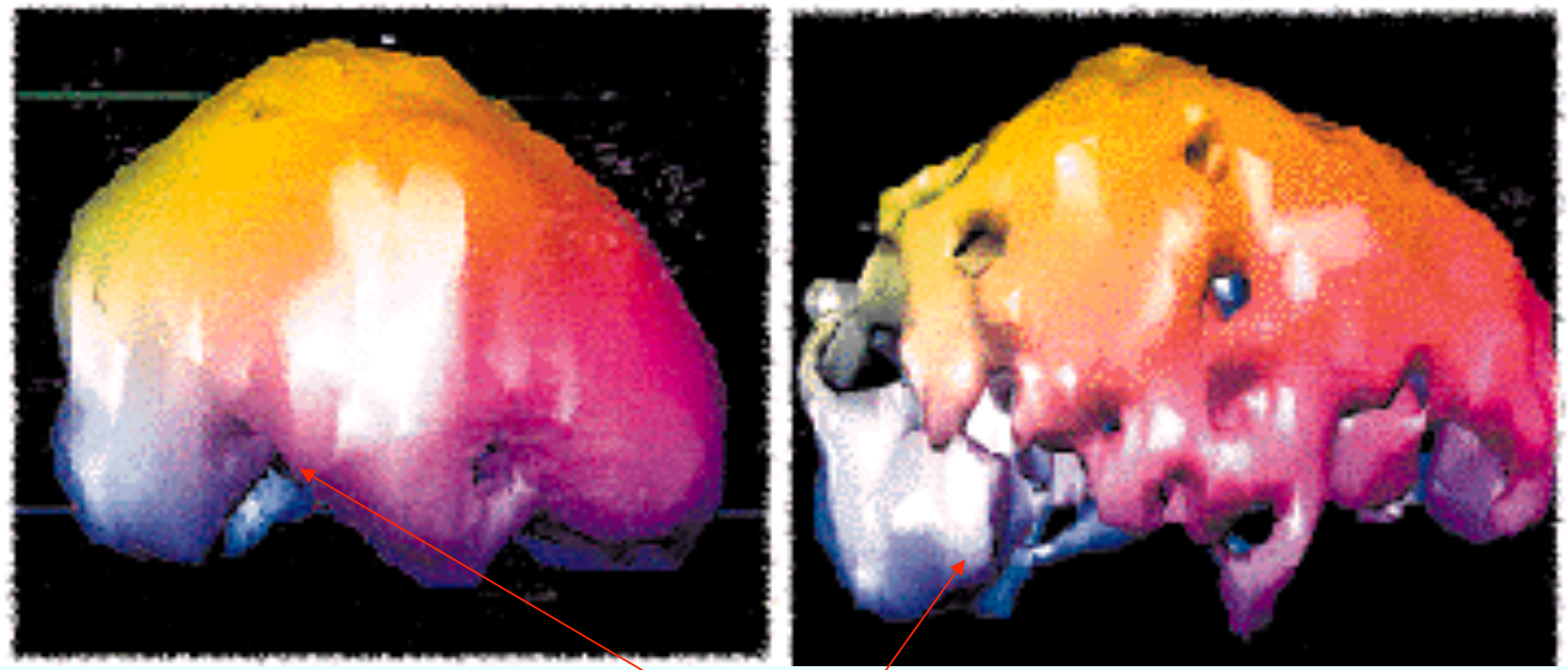
Faces of Meth

Ruined Lives



Brain Damage

Before **After**



Note extent of Prefrontal Cortical Damage

Methamphetamine-Related Brain Damage –As Cells are damaged, systems do not work together anymore, some parts do not function at all

Depletion of dopamine, norepinephrine, serotonin, and natural opioids (endorphins, enkephlins, dynorphins)

JD

"Crashing" is due to the depletion of essential brain chemicals –it is not restful sleep

Stimulants *Summary*

Unpleasant feelings associated with withdrawal will be felt by the user regardless if it is from commonly used stimulants - caffeine and nicotine - or from illicitly used stimulants – meth, cocaine and others.

Crash increases; high decreases

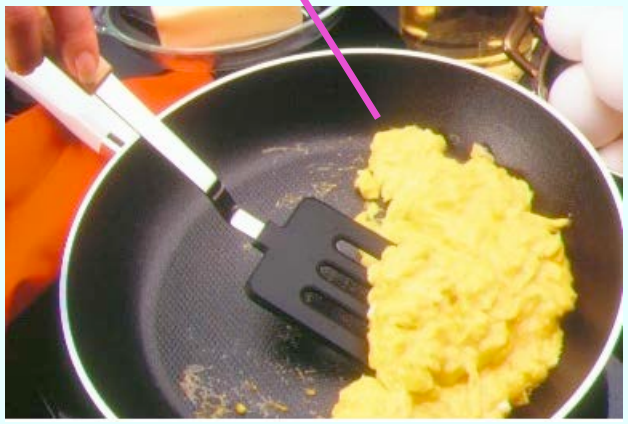
Euphoric = $$ Feeling $$

Aggressive = Anger

Paranoid = Fear

Also Cyclic

This is your Brain on Psychedelics



- **Dig the “a u r a” on the outside Maann!!**
- **Scrambled mush on the inside…**

“What….What, What’d ya say Duuude?”

Hallucinogens

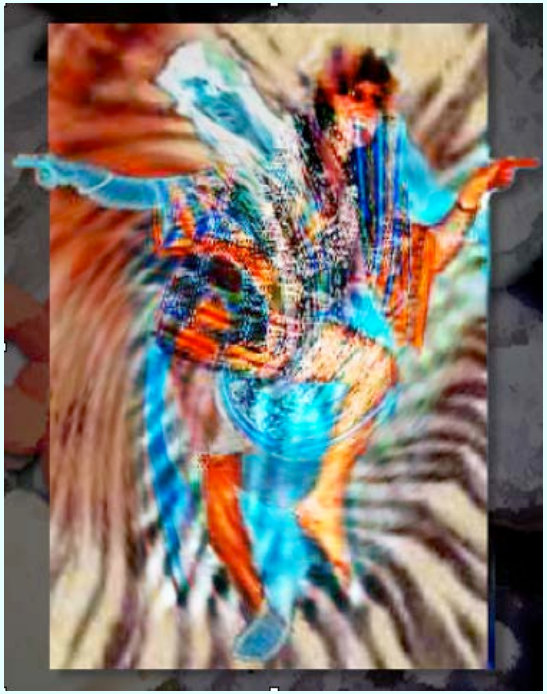
- Some are **naturally occurring**
  – others are **manufactured**

- Include, but are not limited to –
  - **Marijuana**
  - **Psilocybins "shrooms"**
  - **Peyote -- "buttons"**
  - **Jimson Seed - Loco Weed**
  - **Ergot fungus** - **LSD**
  - **PCP**
  - **Ketamine**

POISON CONTROL 1-800/222-1222

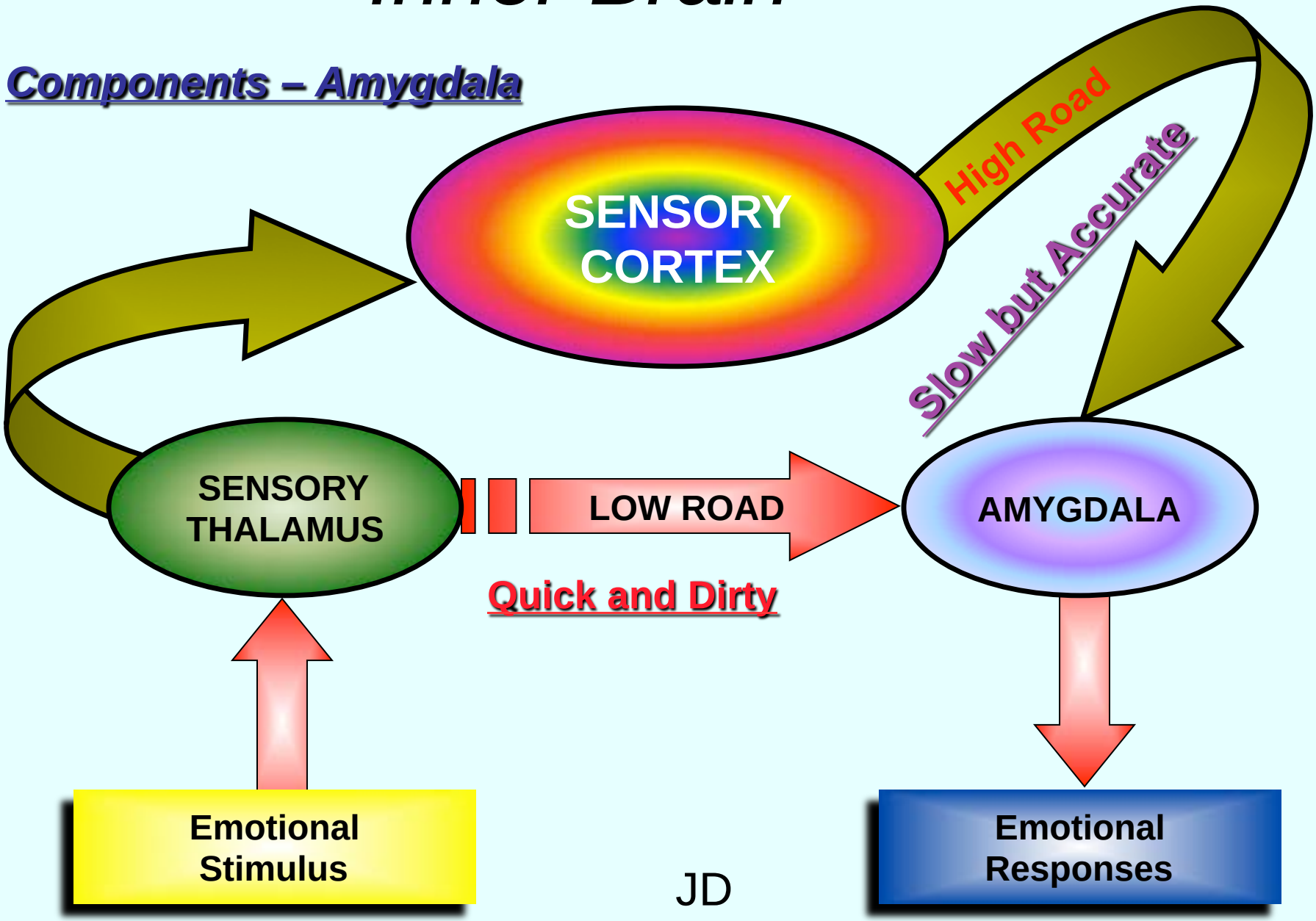
Hallucinogens

- Term for broad group of drugs that cause users to –
  - Hallucinate
  - Has properties that affect person’s sense of reality perception
- Distorts the “7” senses
  - Sights
  - Sounds
  - Smells
  - Taste
  - Touch **[Possible synesthesia]**
  - Sense of Time
  - Common Sense - ***Stupefaction***



Inner Brain

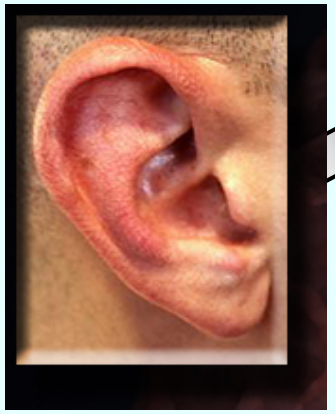
Components – Amygdala

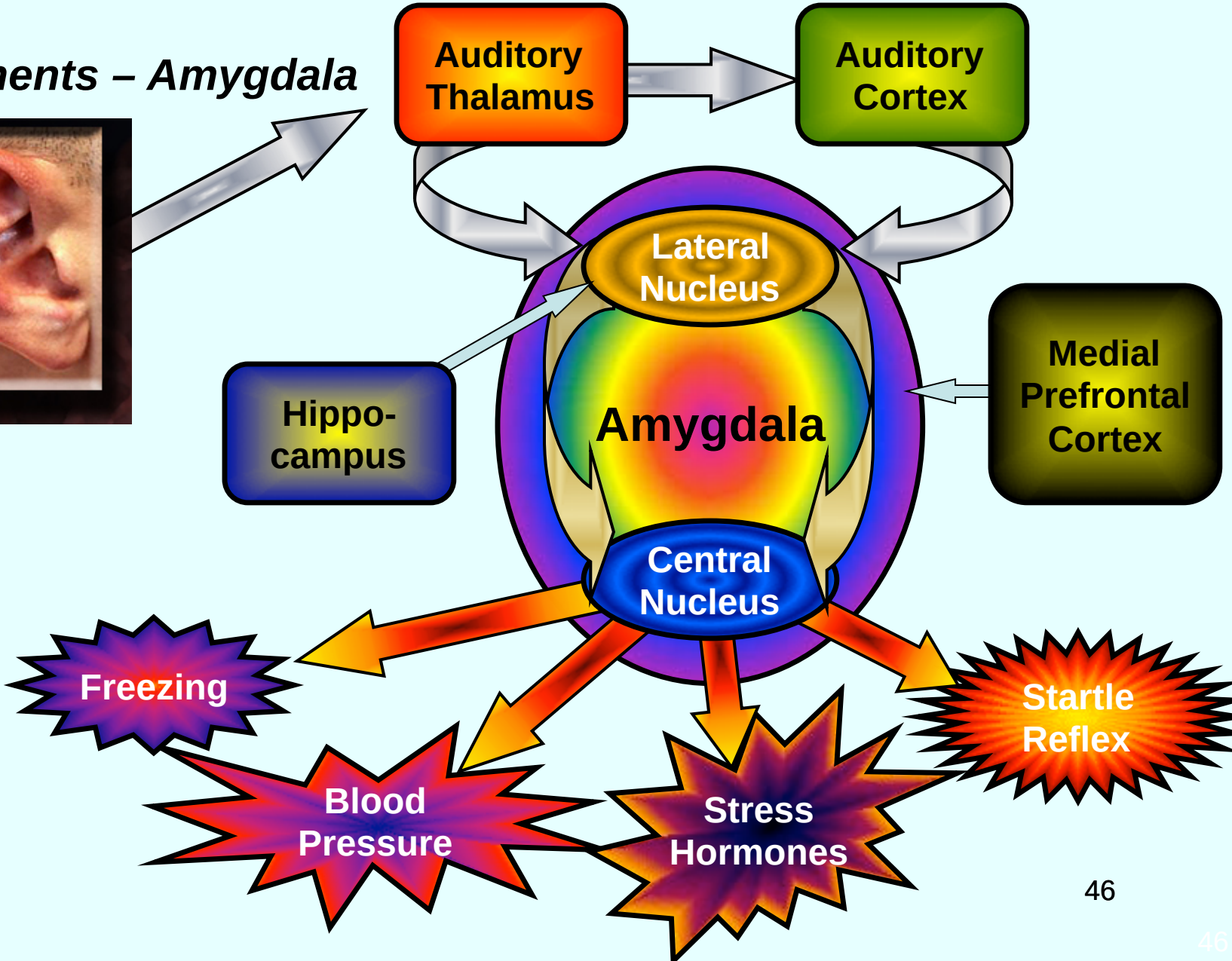


JD

Inner Brain

Components – Amygdala





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Hallucinogens

Hallucinogens distorts the 7* senses; sights, sounds, smells, taste, touch, and sense of time, common sense.*

People on hallucinogens have trouble thinking rationally and often lose touch with reality, disconnected. Persons on these can pose a threat to themselves, and those around them.

Lesson Summary

Proper medical "drug use" is very unlikely to cause addiction or problems.

The sad element of "drug abuse" is that whatever the drug abuser seeks, they lose.

….. or in other words the desired effects decrease while the negative effects increase.

Coming Attraction

Gateway …..What does it take???

MCSHC' 12 *Lesson Sources*

Resource Links: **ALL:** **http://www.**

.Whitehousedrugpolicy.gov/hidta/midwest.html

.dea.com

.nida.nih.gov

.ondpc.gov

.pdrhealth.com & .webmd.com