Medicated Children and Adolescents in Play Therapy: Teaching Play Therapists about the Intersection of Neurobiology and Psychopharmacology

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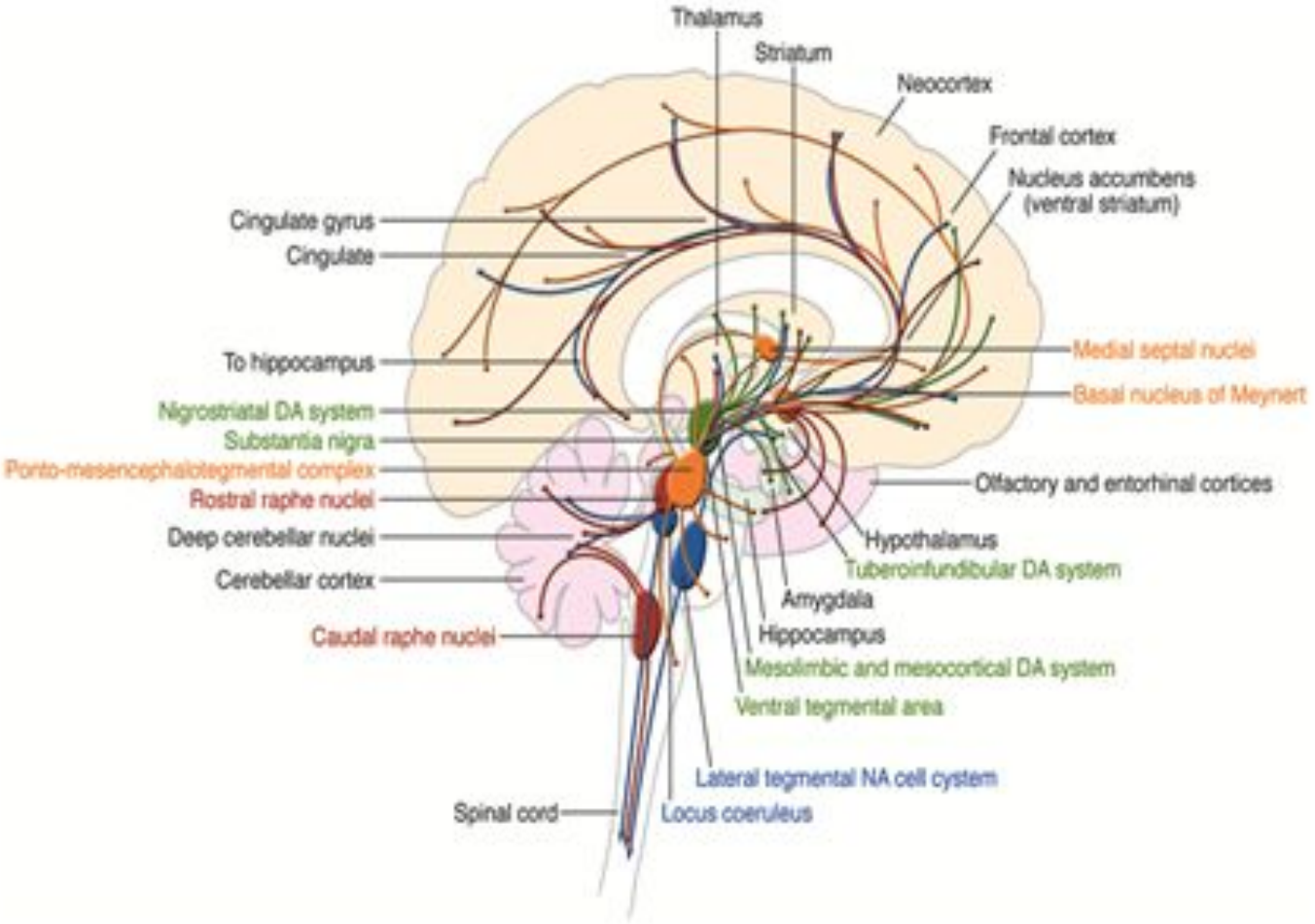
8:30 am-4:30 pm

Goals for Today

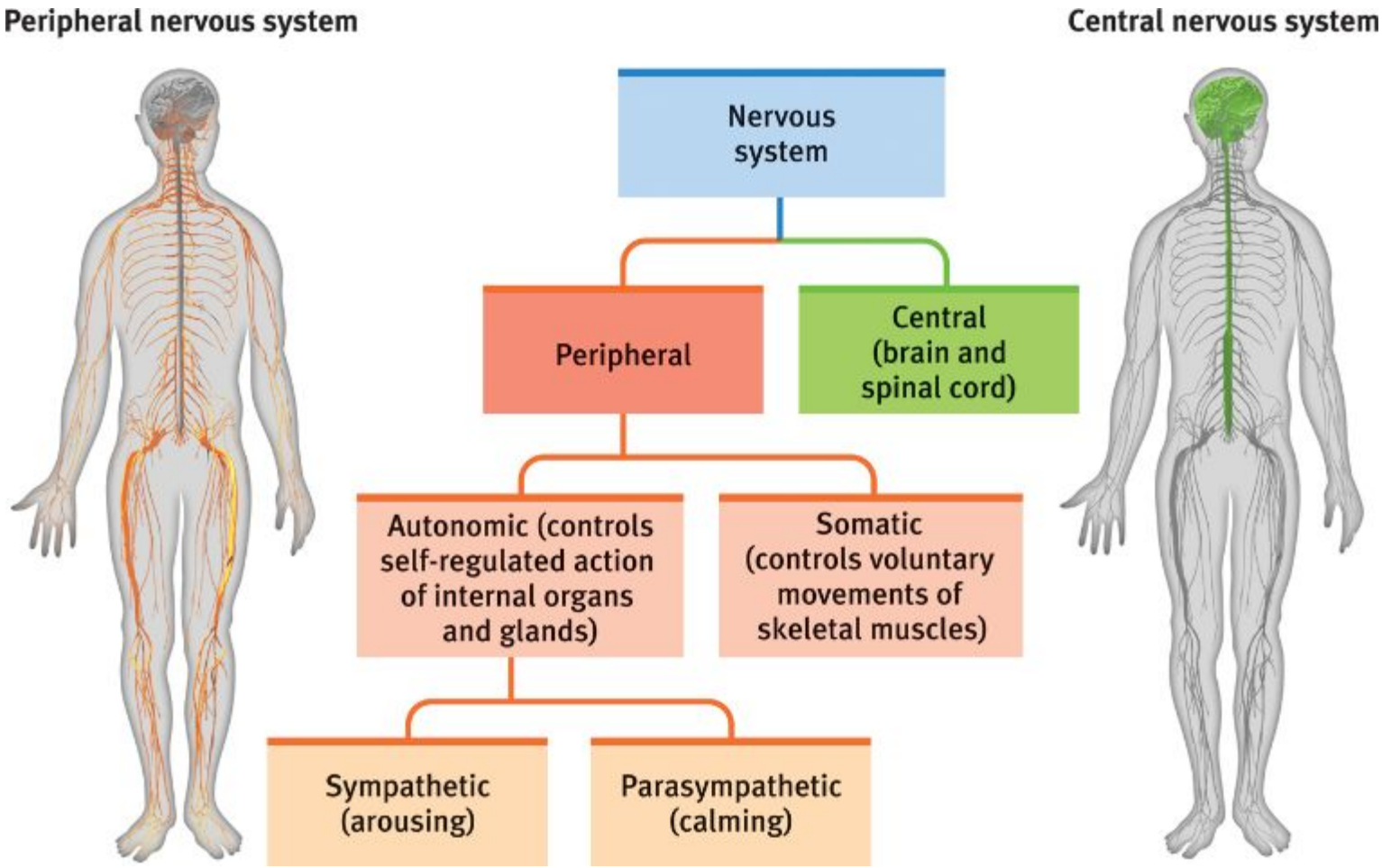
Following the workshop, participants will be able to:

- Discuss basic neurobiology, neurotransmitters, and brain functioning.
- Identify different medications and their mechanisms of action.
- Discuss the interaction of neurobiology, medication, and Play Therapy.
- Identify how beneficial effects of medication may facilitate Play Therapy.
- Utilize Play Therapy techniques to compensate for the side effects of medications.
- Develop an individualized Play Therapy plan for each medicated child.

Brain Complexities



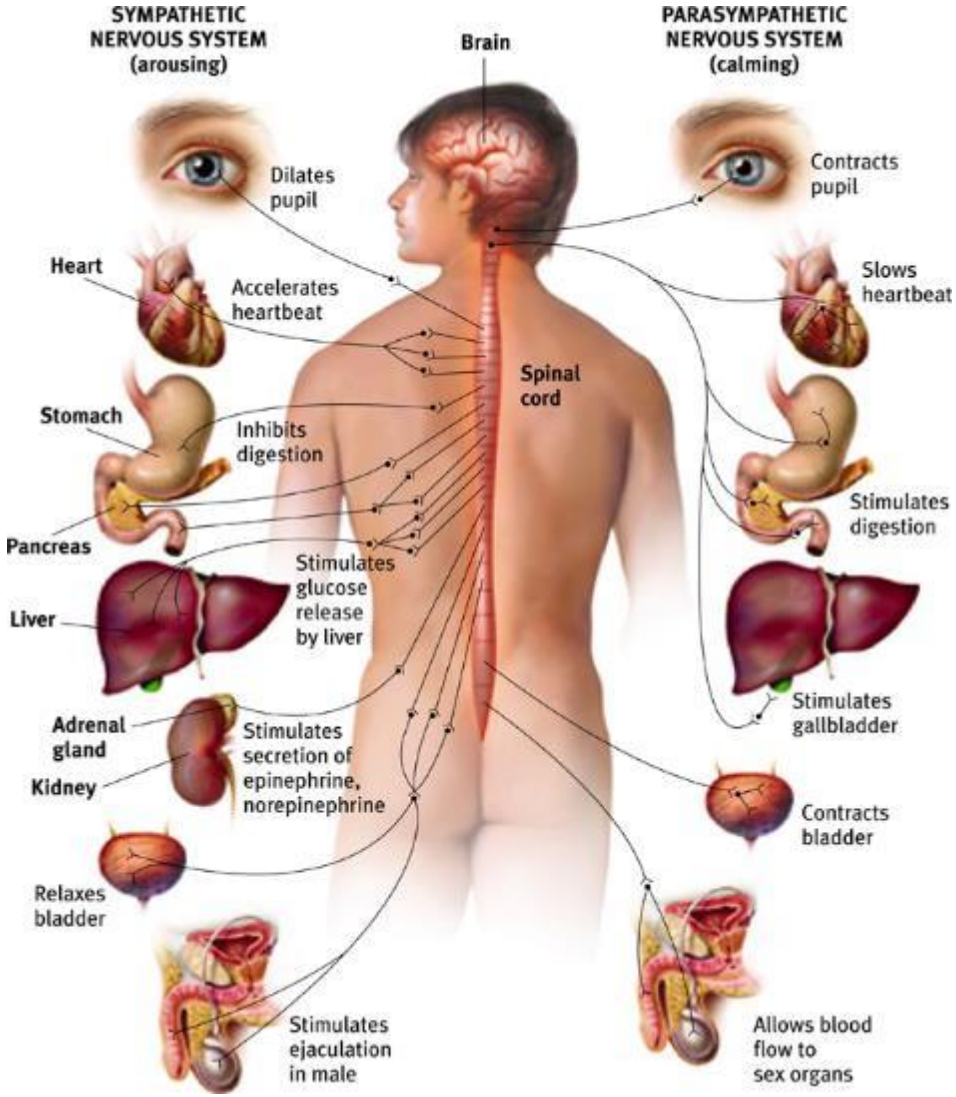
Nervous System



Nervous System (cont)

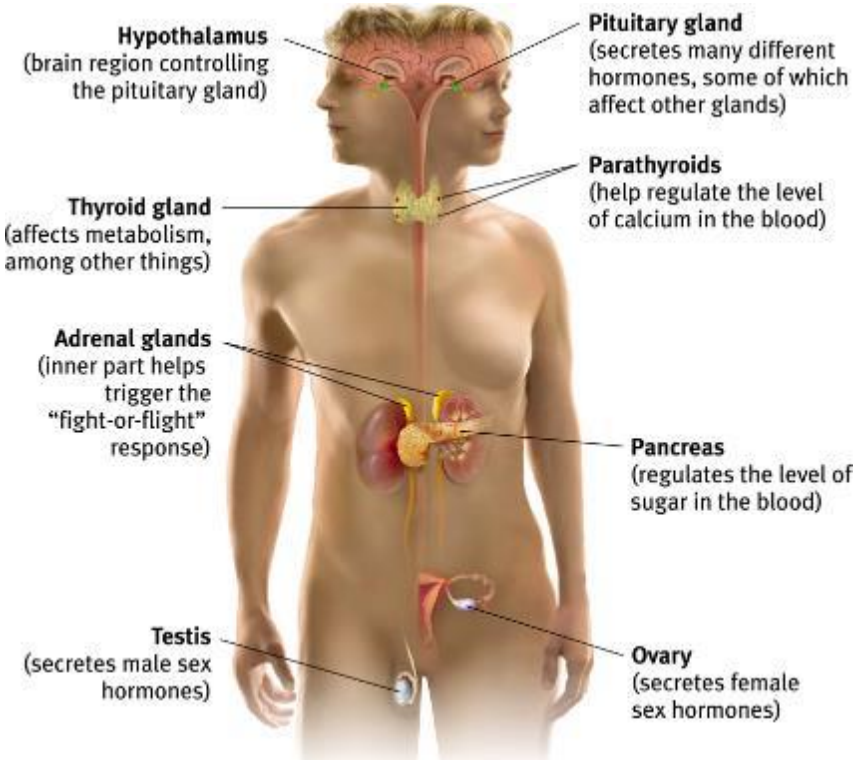
Sympathetic NS
Arouses
(fight-or-flight)

Parasympathetic
NS
Calms
(rest and digest)

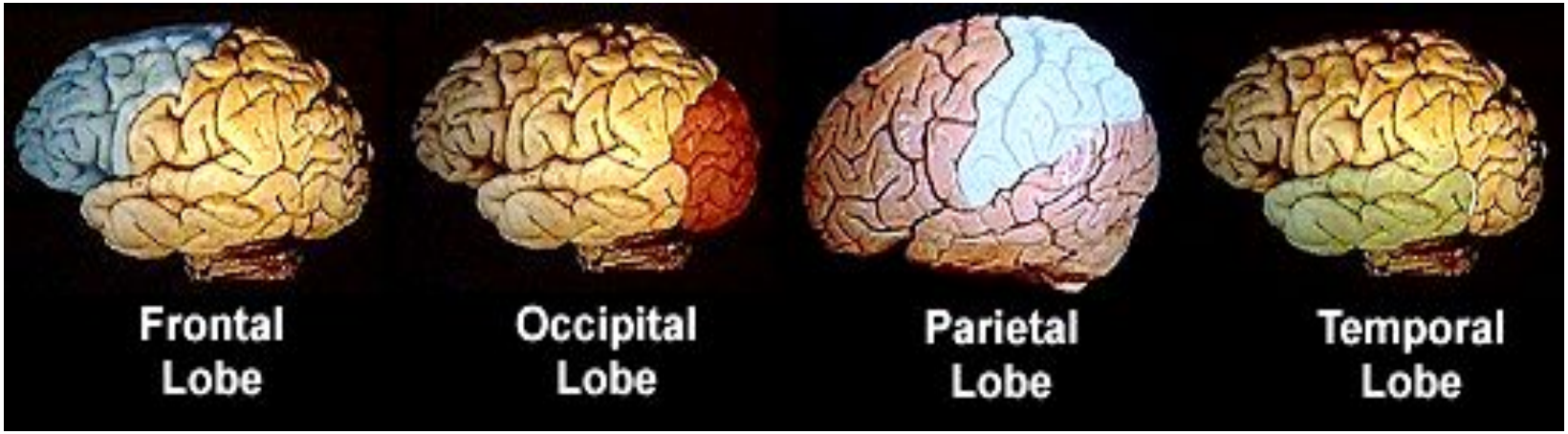


Endocrine System

The Endocrine System is the body's slow chemical communication system. Communication is carried out through hormones synthesized by a set of glands.



The Basic Brain



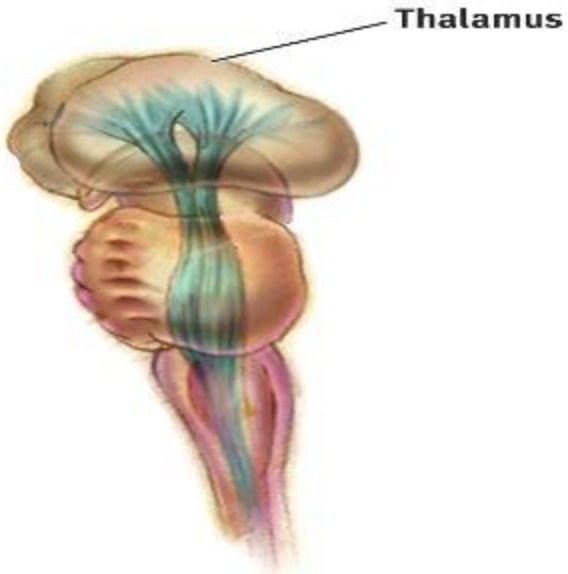
Self-regulation, problem solving, goal setting, & social cognition

Vision and perception

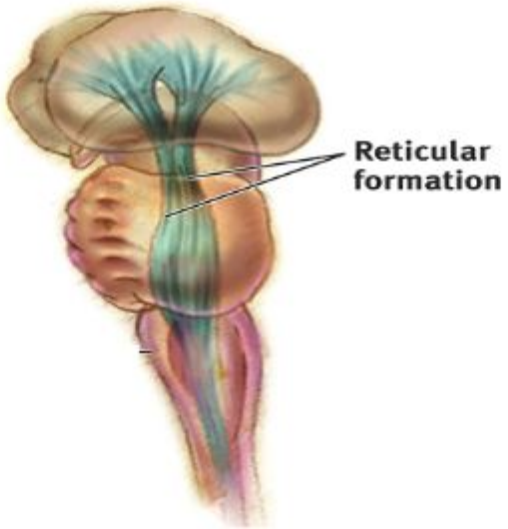
Sensory motor perception, & spatial abilities

Hearing, language, memory, & social emotional function

Brainstem



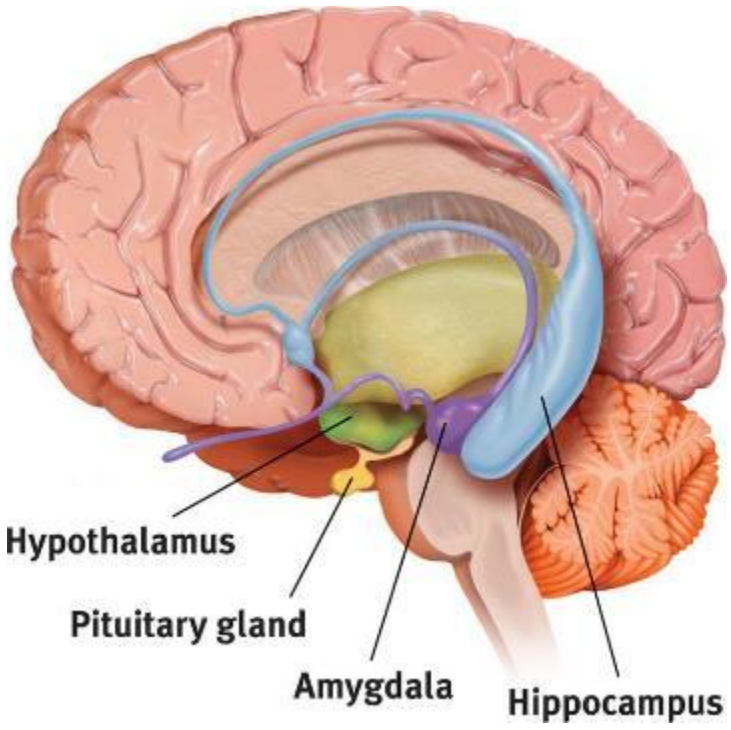
The Thalamus [THAL-uh-muss] is the brain's sensory switchboard, located on top of the brainstem. It directs messages to the sensory areas in the cortex and transmits replies to the cerebellum and medulla.



Reticular Formation is a nerve network in the brainstem that plays an important role in controlling arousal.

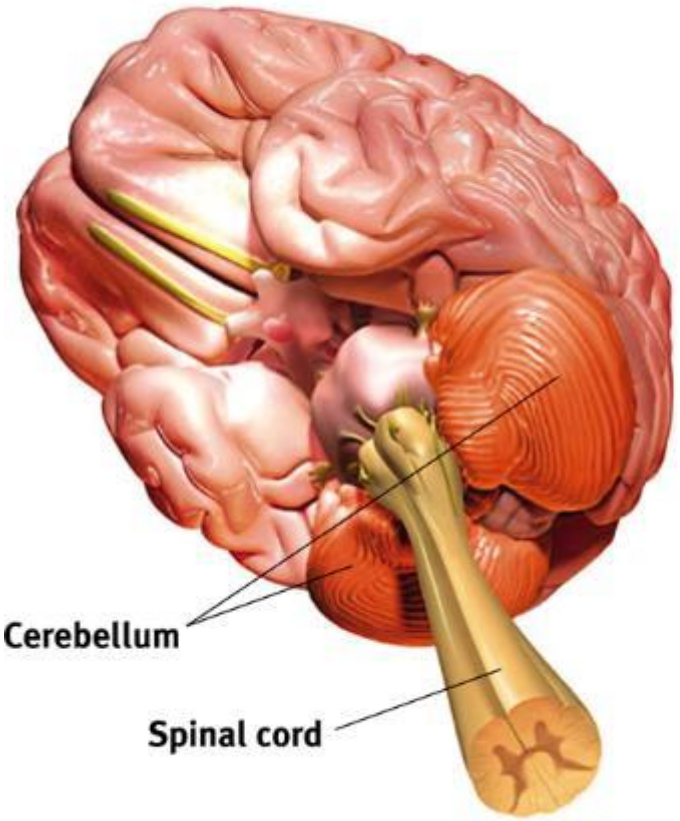
The Limbic System

The Limbic System is a doughnut-shaped system of neural structures at the border of the brainstem and cerebrum, associated with emotions such as fear, aggression and drives for food and sex. It includes the hippocampus, amygdala, and hypothalamus.



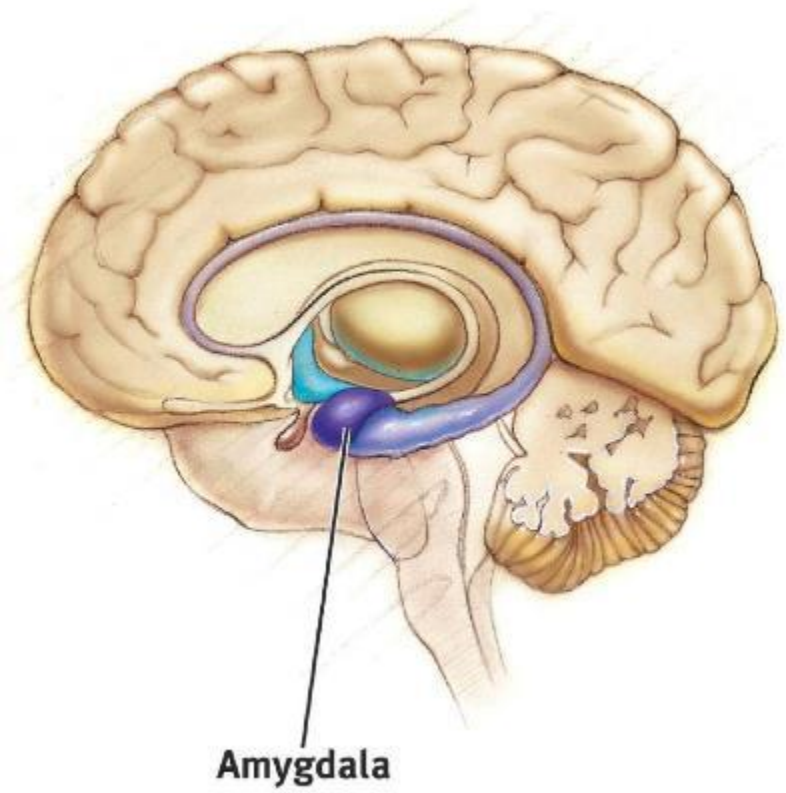
Cerebellum

The “little brain” attached to the rear of the brainstem. It helps coordinate voluntary movements and balance.



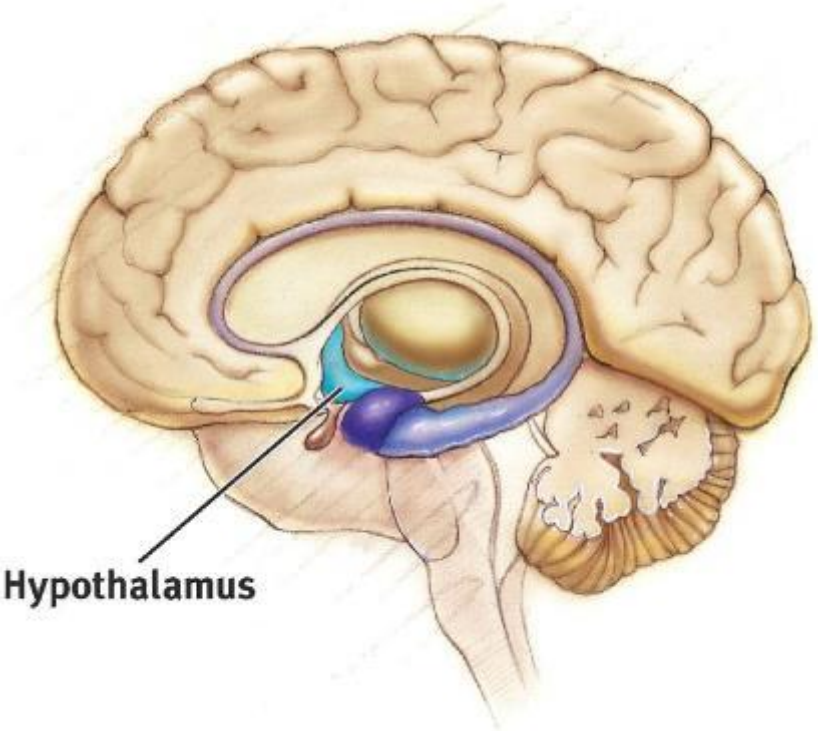
Amygdala

The Amygdala [ah-MIG-dah-la] consists of two lima bean-sized neural clusters linked to the emotions of fear and anger.



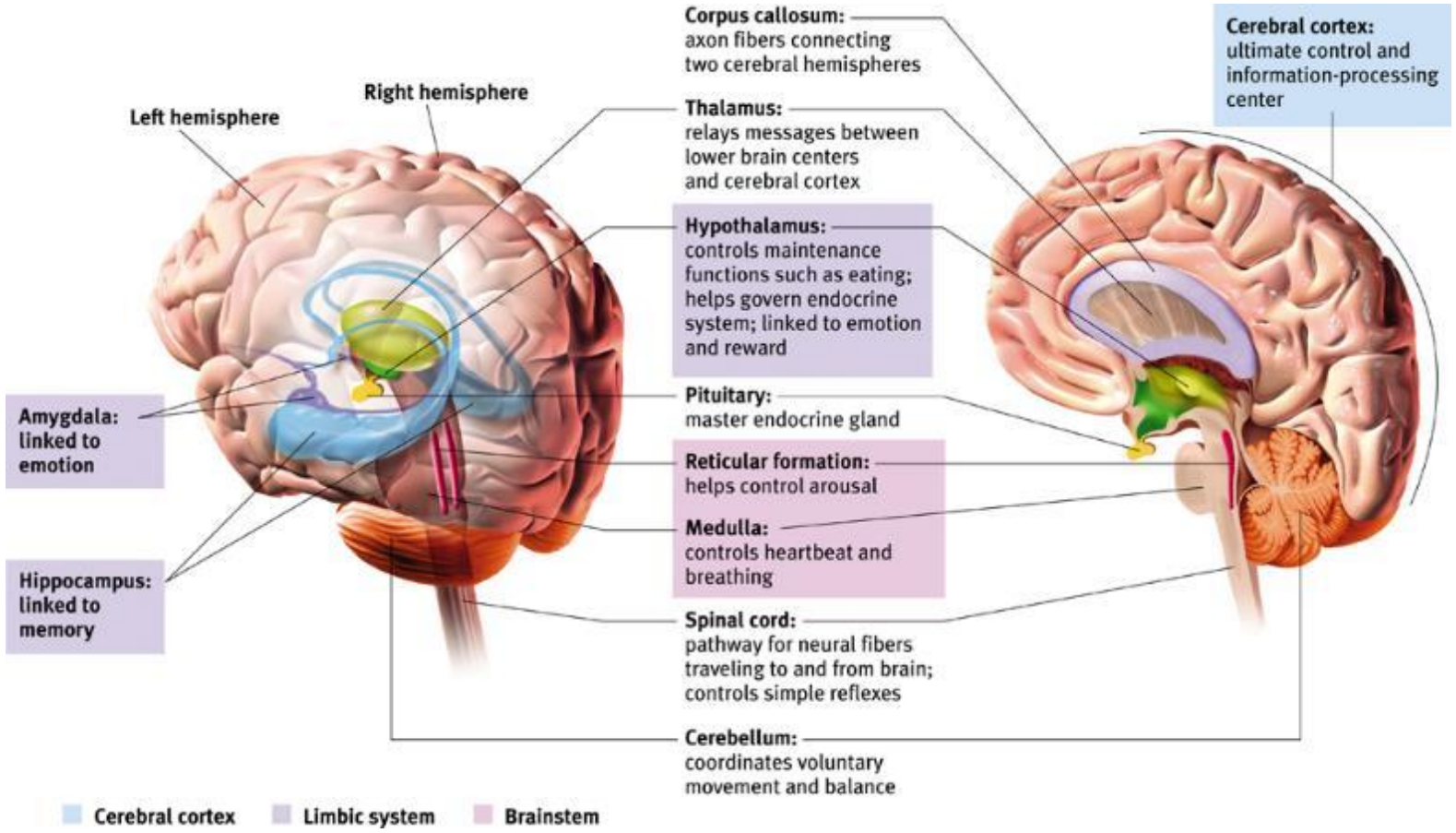
Hypothalamus

The Hypothalamus lies below (*hypo*) the thalamus. It directs several maintenance activities like eating, drinking, body temperature, and control of emotions. It helps govern the endocrine system via the pituitary gland.



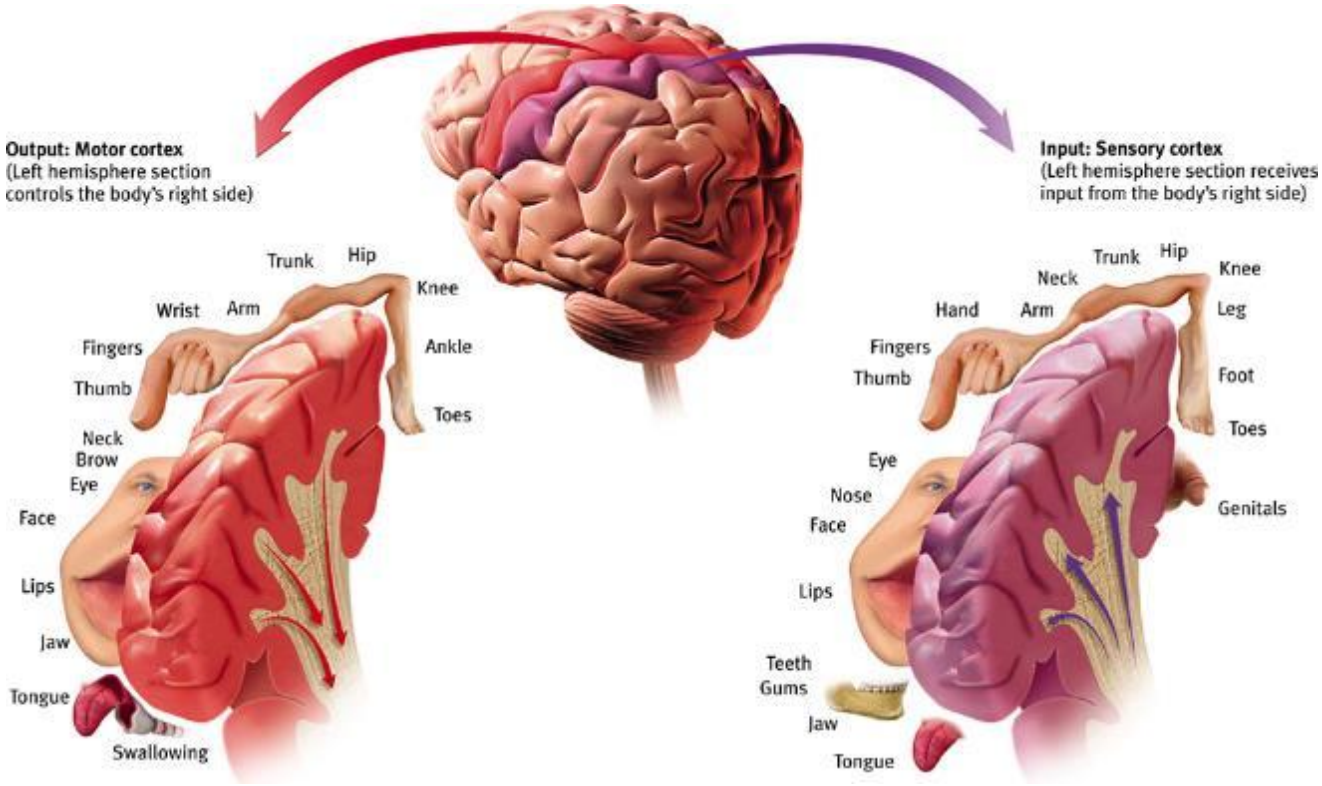
The Cerebral Cortex

The intricate fabric of interconnected neural cells that covers the cerebral hemispheres. It is the body's ultimate control and information processing center.



Functions of the Cortex

The Motor Cortex is the area at the rear of the frontal lobes that control voluntary movements. The Sensory Cortex (parietal cortex) receives information from skin surface and sense organs.



Brain Growth

AGE	BRAIN WEIGHT (GRAMS)
20 WEEKS GESTATION	100
BIRTH	400
18 MONTHS	800
3 YEARS OLD	1100
ADULT	1300 - 1400

Brain Changes

At birth, most neurons the brain will have are present (**approx. 100 billion neurons**)

By age 2 years, brain is 80% of adult size

What keeps growing?

Other brain cells (glia)

New neuron connections

approx. 1000 trillion connections by age 3 yrs.

Brain Changes (cont)

Overproduction of neurons and connections among neurons

Selective reduction of neurons and connections among neurons

Waves of intense branching and connecting followed by reduction in neurons

- Before birth through 3-years-old
- Again at 11- or 12-years-old

Brain Changes (cont)

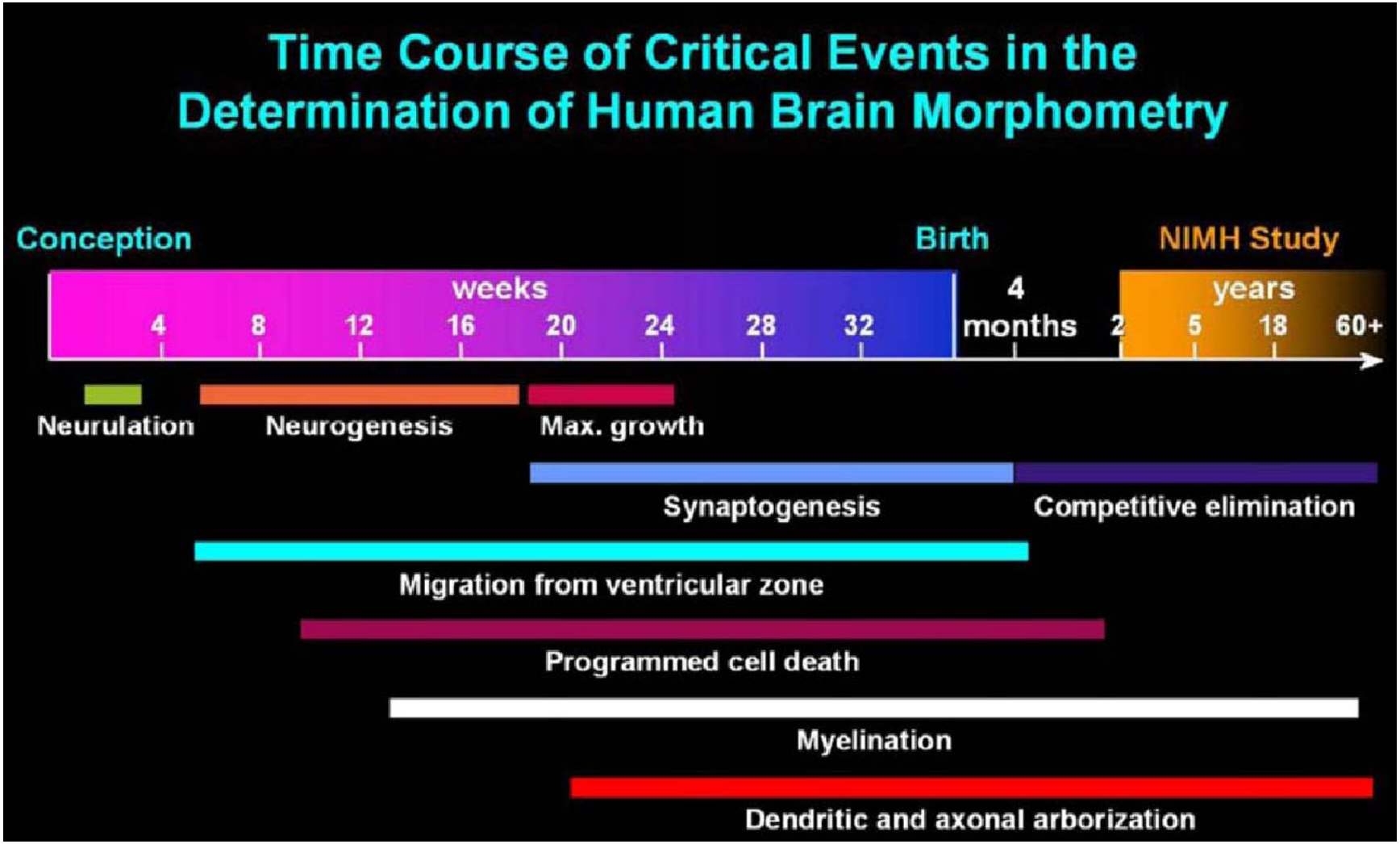
- Anatomical studies of brain development show
  - Occipital lobes show earliest pruning
    - Frontal and Temporal lobes show growth of neural connections longer than other areas of the brain…through 3 years old
    - Frontal and Temporal lobes show pruning of connections longer than other areas of the brain
      - Greatest change between 2 years and 5 years

Brain Changes (cont)

Myelin & Age Changes

Speed of connection and conductivity
Begins at birth, rapidly increases to 2-years old
Continues to increase more slowly through 30-years-old

Brain Changes - Critical Events (Toga & Mazziotta, 2000)



Brain Changes and Important Developments

Brain areas with longest periods of organization related to…

- self-regulation,
- problem-solving,
- language/communication
- Social bonding

Most vigorous growth, pruning, connecting, and activity occurs between **1-1/2 years through 3 or 4 years old.**

May be one of the most important periods for developing self-regulation, problem-solving, social-emotional, and language/communication behaviors.

Impacting Brain Development

Genes form neurons, connections among major brain regions.

Environment and experience refines the connections; enhancing some connections while eliminating others.

Brain development is “activity-dependent”

Every experience excites some neural circuits and leaves others alone.

Neural circuits used over and over strengthen, those that are not used are dropped resulting in “pruning”.

Medication ??????????????

Brain Areas and Anatomical Development

- Brainstem (0-1)--Regulation of arousal, sleep, and fear
- Diencephalon (1-3)--Integration of sensory input and fine motor skills
- Limbic System (3-8)--Emotional states and emotional regulation, social language, interpretation of non-verbals
- Cortical Areas (8-adult)--Abstract cognitive functioning, integration of socio-emotional information

Brain Areas and Anatomical Development

- Brain stem and Diencephalon are harder to change if poorly developed.

Normal Development and Regulation

Consider:

The Individual

Attachments

Relationships

Culture

Environment

Genetics

Produces Functional & Regulated Affect/Behavior

“DIR” Model (Greenspan & Wieder, 1997; Willis, 2007)

Developmental bio-psychosocial model

Developmentally-based
Individual differences
Relationship focused

Functional Emotional Developmental Levels (Greenspan & Wieder, 1997)

2-3 mon **Shared Attention**

3-5 mon **Engagement**

6-9 mon **2-way Intentional Communication**

12-18 mon **Behavioral Elaboration**

Complex, non-verbal, gestural communication patterns

24-36 mon **Representational Communication**

Ideas, Words

36-48 mon **Emotional Thinking**

Linking ideas and thoughts

Individual Differences

Sensory Processing systems

Cortical processing systems

– Auditory
– Visual-spatial
– Intelligence
– Memory system

Motor output processes

Relational Context in Early Childhood

Parent – Child Interactions

Patterns of Attachment, Cooperation, Conflict-doing, conflict-resolution Regulation of negative & positive affects, Intimacy communication.

Sibling and Peer Relationships

Birth order, Sibling spacing, Cooperation patterns,

Conflict processes, Peer experiences and opportunities.

Relational Context in Early Childhood

Socio-Emotional Co-Regulation

Co-regulation of emotions

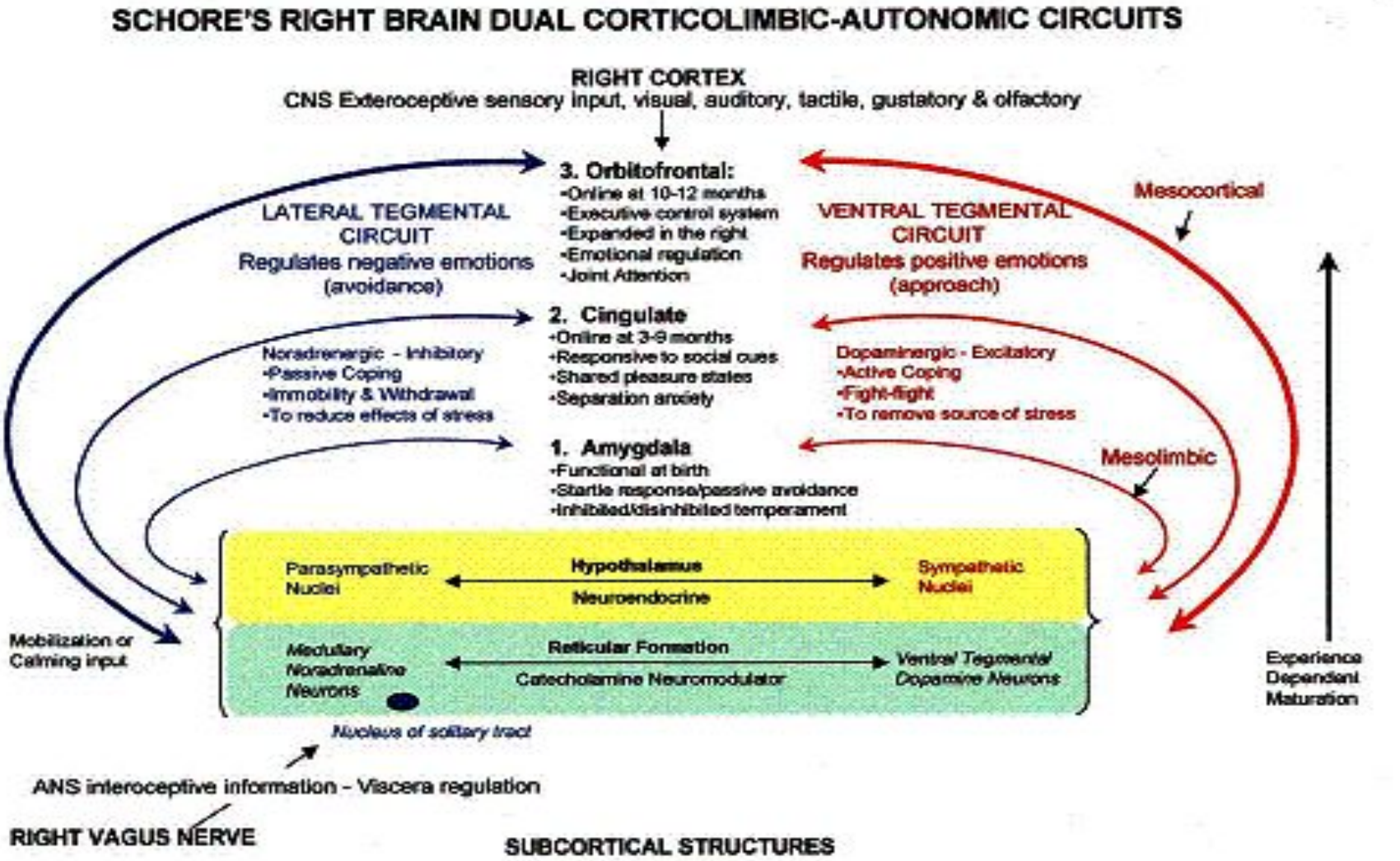
– Separation anxiety & fears, Anger & frustrations, Disappointment

Intimate available relational individual

Cultural Patterns

Parenting styles, Childcare variations, Social units & Multiple early relationships, Older children involvement in child-rearing, Imitative roles, Toys and play

Adaptive Functioning (Shore, 2001, 2009)



The Right Brain

The right brain, according to Schore (2000 and 2009b)

is comprised of a

- lateral tegmental circuitry, which controls negative emotions, avoidance mechanisms, and passive coping
- a ventral tegmental circuitry, which controls positive emotions, approach mechanisms, and active coping

Order of Activation

- The autonomic nervous system, providing sensory information;
- amygdala, which generates fight, flight, and freeze responses;
- cingulate, which interprets social cues;
- orbitofrontal cortex, which provides executive control.

The Ventral System

Schore (2000, 2009b) states, when attachment is disrupted or fails to occur (i.e., lacks appropriate stimulation), it is the ventral tegmental circuitry that is impacted by dysfunctional patterns of relating; hence, the approach process is disrupted and avoidance process goes unaffected.

What's Functional?

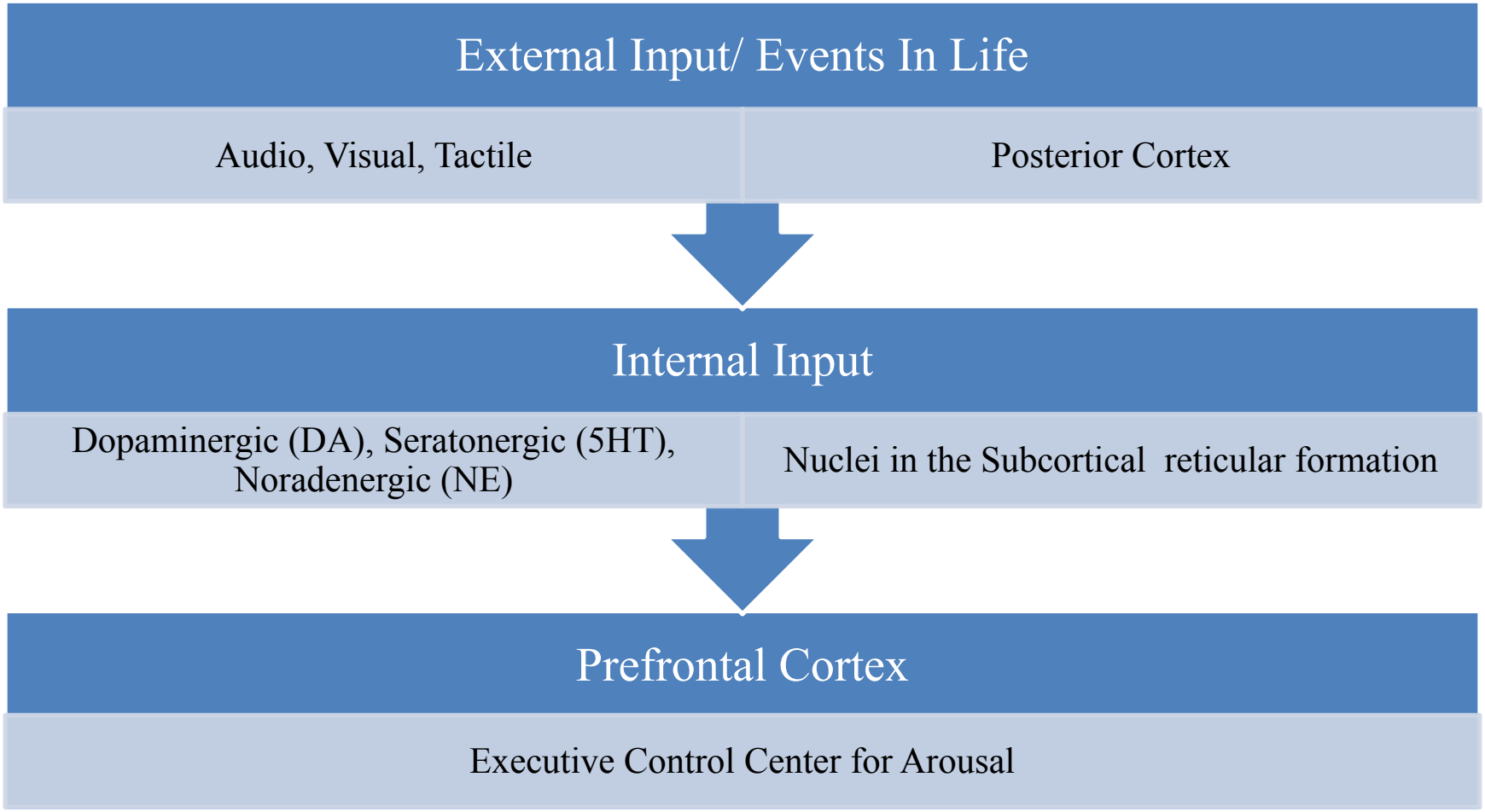
3 Types of Self-Regulation

- Emotional Self-Regulation--between self and caregiver (self & other).
- Behavioral Self-Regulation--the ability to initiate/inhibit behavior appropriate to context.
- Sensory Modulation--the ability to regulate one's reactivity (responsiveness) to sensory input.

Neurobiology and Attachment

- Secure Attachment- a person capable of emotional self-regulation and has the ability to cope with stress
- Secure Attachment in Neurobiological Formation: healthy, consistent, and complete development of the orbitofrontal cortex, ventromedial prefrontal cortex, and connections in to subcortical regions of the brain.

Attachment Neurobiology Process



Polyvagal Theory

The more primitive branch elicits immobilization behaviors (e.g., feigning death), whereas the more evolved branch is linked to social communication and self-soothing behaviors.

Polyvagal Theory

- The vagus nerve is a component of the autonomic nervous system
- Originates in the medulla
- Two (2) branches
- Associated with a different adaptive behavioral strategy
- Inhibitory in nature via the parasympathetic nervous system
- The vagal system is in opposition to the sympathetic-adrenal system, which is involved in mobilization behaviors

Polyvagal Theory

Dorsal branch

- unmylenated
- primal survival strategies
- freezing

Ventral branch

- Mylenated
- A sophisticated system of behavioral and affective responses to an increasingly complex environment
- Regulates of the sympathetic “fight or flight”
- Social Communication, Calming, Self-soothing
- Can inhibit or disinhibit the limbic system

Okay, So Let's Consider Dysfunction and Dysregulation?

The Dysregulated Brain Has a Mind of Its Own!!!!!!

What's Leads to Dysfunction?

- Abnormal Development
- Attachment Disturbances
- Direct Physical Brain Trauma

Abnormal Development and Dysregulation

Consider:

The Individual

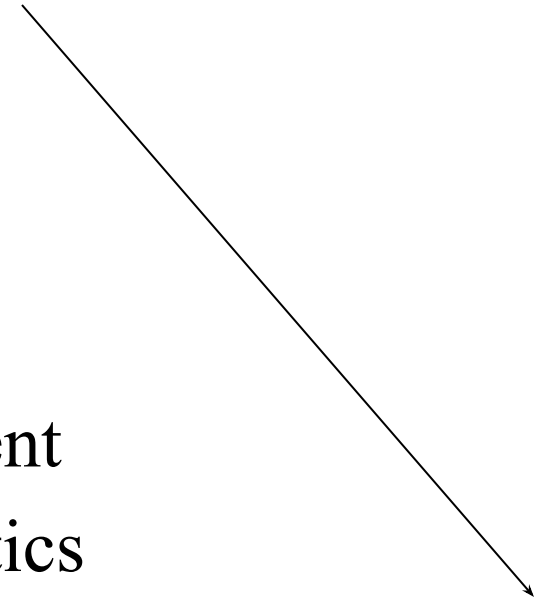
Attachments

Relationships

Culture

Environment

Genetics



Produces Dysfunctional & Dysregulated Affect/Behavior

Attachment Trauma/Disturbances

- Impairments in the development of the orbitofrontal and ventral prefrontal areas.
- Lead to:
  - Attachment Disorders (Insecure/ Disorganized)
    - High risk for PTSD and relational violence
  - Chronic Disturbance in Affect Regulation (Axis 2)
  - Chronic Stress (Anxiety, Depression)

Right Brain Development: Affect Regulation (Schore, 2001)

- Amygdala inhibition by orbitofrontal regions
- "Amygdala hijacking" – fight response
- Hippocampus memory systems and Autonomic Nervous System (ANS)
- Consequences of Trauma

– Poor affect regulation

Traumatic Brain Injury

Childhood illnesses (high fevers, meningitis)

Accidents or Physical Abuse

???? Medications ??????

The Neurochemical Origins of Disruptive Behaviors

- Those related to dopamine [DA] and aggression, irritability, hyperactivity, and problems with attention and motivation;
- Those related to norepinephrine [NE] and negative emotions and withdrawal;
- Those related to serotonin [5HT] and impulsivity.
- A fourth category, gamma-aminobutyric acid [GABA], is not usually responsible for disruptive behaviors, but may be involved in regulating these behaviors.

Disruptive Behaviors, Neurotransmitters, and Brain Regions

- Emotional regulation is connected to the limbic system and prefrontal cortex (Wise, 2004) and is facilitated by DA and NE pathways.

- Motivation is connected to the striatum and prefrontal cortex (Aarts, van Holstein, & Cools, 2011) and is facilitated by DA pathways.

- Attention and hyperactivity are connected to the lateral prefrontal cortex, dorsal anterior cingulate cortex, caudate, & putamen (Bush, Valera, & Seidman, 2005) and are facilitated by DA and NE pathways.

Disruptive Behaviors, Neurotransmitters, and Brain Regions (cont)

- Impulsivity is connected to the dorsolateral prefrontal cortex, orbitofrontal cortex, and anterior cingulate cortex (Adinoff et al., 2003; Royall et al., 2002) and is facilitated by DA and 5HT (Dagher & Robbins, 2009).

- Finally, the previously mentioned neurotransmitters are excitatory in nature, while GABA is inhibitory in nature and connected to all levels of the central nervous system (Levy & Degnan, 2012).

Another Point

We Now Have a Big Problem!

The ACE Study (Anda et al., 2005; CDC, 1998-2010; Edwards et al., 2005)

Adverse childhood experiences are the most basic cause of health risk behaviors, morbidity, disability, mortality, and healthcare costs

Traumatic events----Prolonged alarm reaction-----Altered neural systems

- Altered cardiovascular regulation
- Behavioral impulsivity
- Increased anxiety
- Increased startle response
- Sleep abnormalities

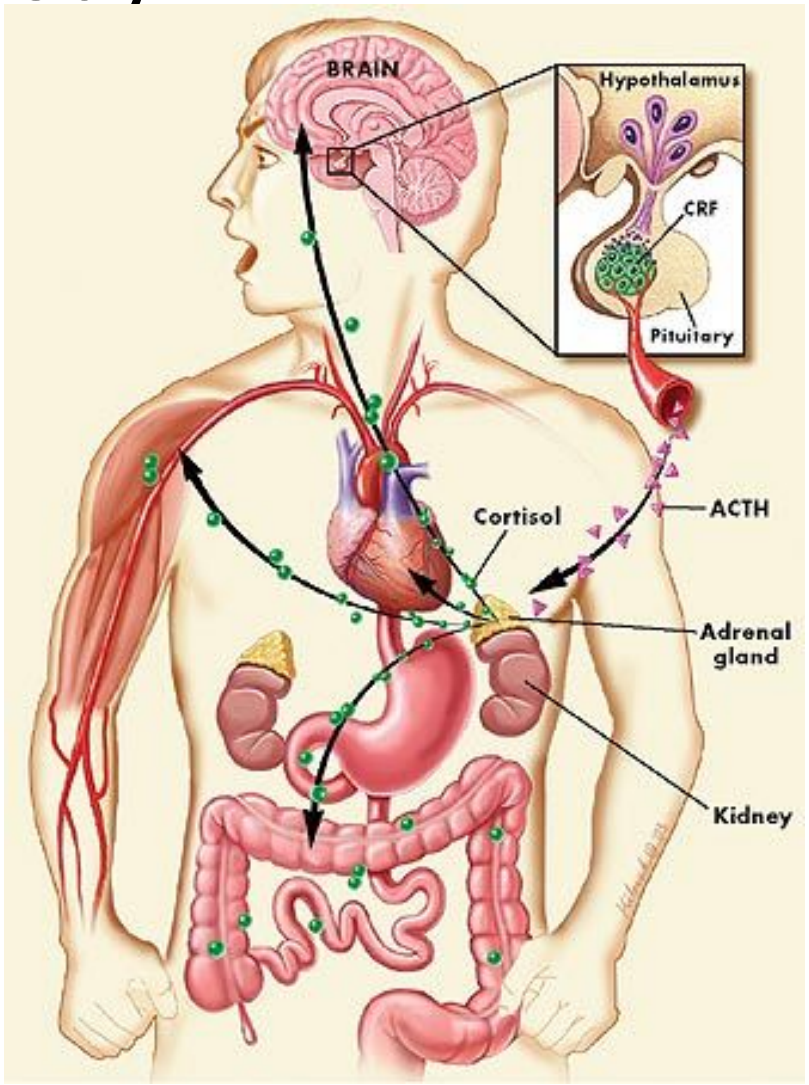
CDC (1998-2010)

Stress, the Brain, & the Body

Stress is the set of changes in the body and the brain that are set into motion when there are threats to physical or psychological

Under threat, the limbic system engages and the frontal lobes disengage. When safety returns, the limbic chemical reaction stops and the frontal lobes re-engage.

(van der Kolk, B., 2005)



Three Levels of Stress Response

Positive

Brief increases in heart rate,
mild elevations in stress hormone levels.

Tolerable

Serious, temporary stress responses,
buffered by supportive relationships.

Toxic

Prolonged activation of stress response systems
in the absence of protective relationships.

Early Childhood Disturbances from Trauma and Risk
(ACE Study)

Regulatory disturbances
PTSD
Oppositional Defiant Disorder
Conduct Disorder
ADHD
Anxiety and Depression
Attachment disturbances
Developmental delays

The Continuum

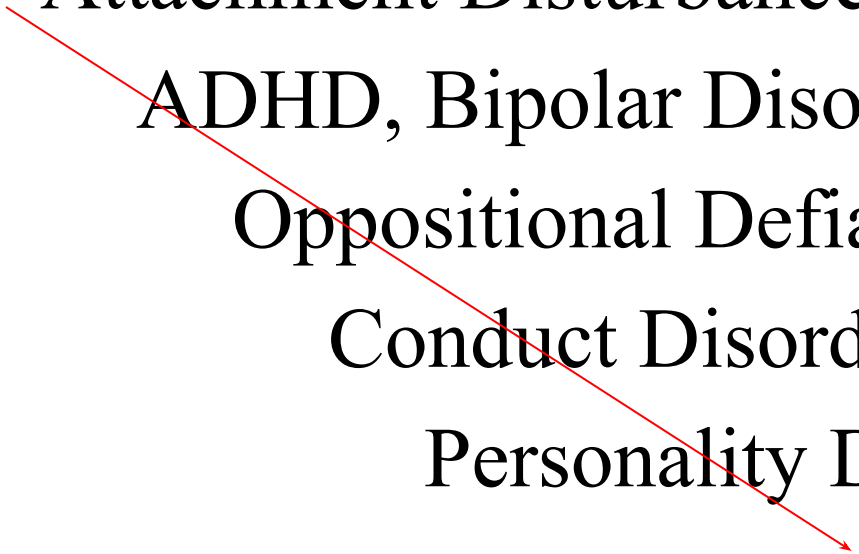
Attachment Disturbance

ADHD, Bipolar Disorder

Oppositional Defiant

Conduct Disorder

Personality Disorder



What's The Point?

We Now Have a Neurobiological Maze, Which is Difficult to Solve?

And

Medications Can Simplify the Maze or Complicate Maze!

Neurotransmitters

Categorized into three major groups:

(1) amino acids (glutamic acid, GABA, & glycine)

(2) peptides (vasopressin, somatostatin, & neurotensin)

(3) monoamines (norepinephrine NA, dopamine DA & serotonin 5-HT) plus acetylcholine (ACh).

Workhorse neurotransmitters of the brain are glutamic acid (glutamate) and GABA.

Neurotransmitters & Function

Acetylcholine - voluntary movement of the muscles, learning, & memory

Norepinephrine – alertness, wakefulness, & arousal

Dopamine - voluntary movement, emotional arousal, & learning, attention

Serotonin - memory, emotions, wakefulness, sleep, hunger, & temperature regulation

GABA (gamma aminobutyric acid) - motor behavior & mood

Glutamate - memory

Glycine - spinal reflexes & motor behavior

Neuromodulators - sensory transmission-especially pain

Neurotransmitter (Excitation vs. Inhibition)

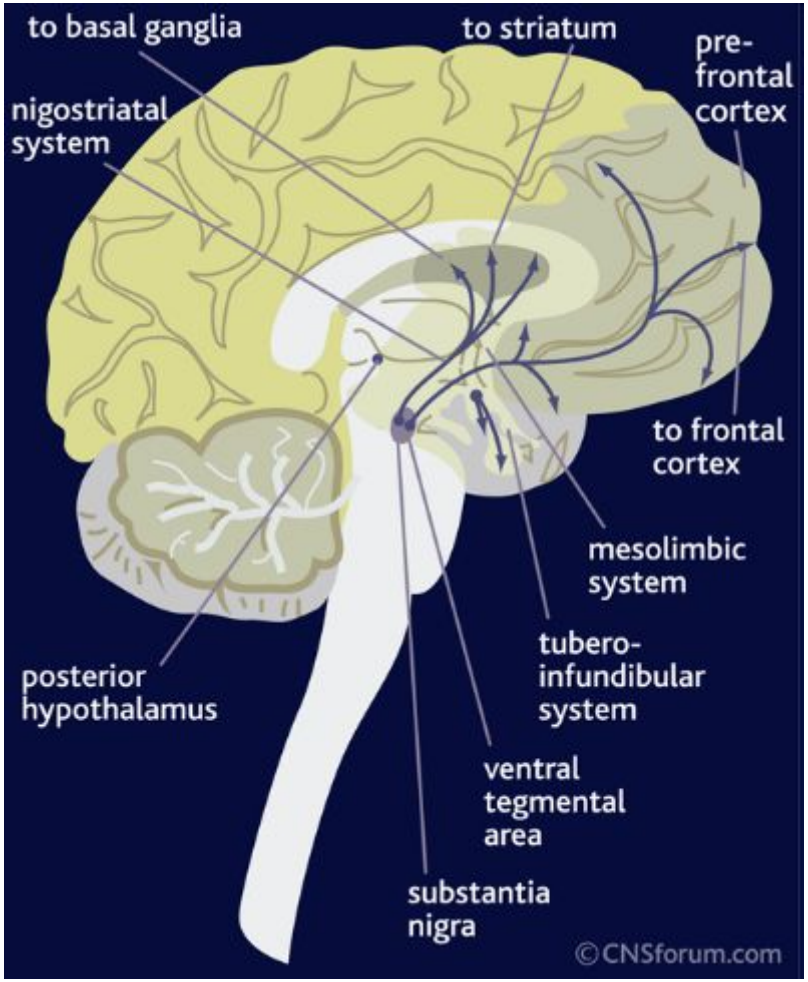
EXCITATORY

- Acetylcholine
- Aspartate
- Dopamine
- Histamine
- Norepinephrine
- Epinephrine
- Glutamate
- Serotonin

INHIBITORY

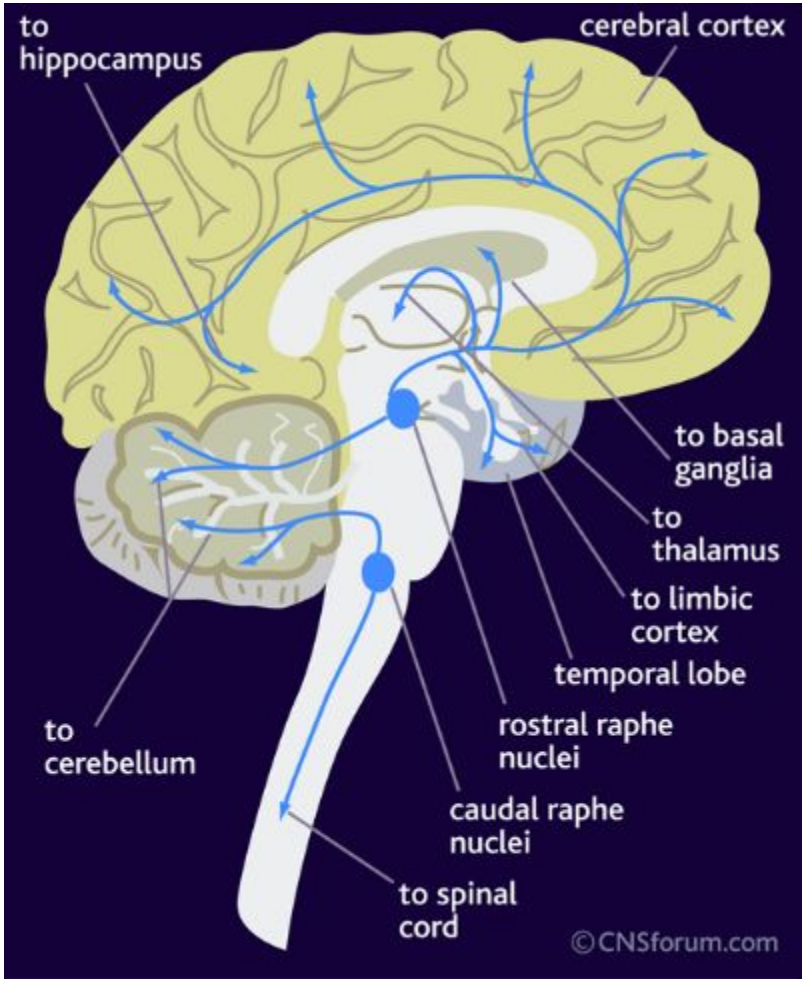
- GABA
- Glycine

Dopamine (DA)



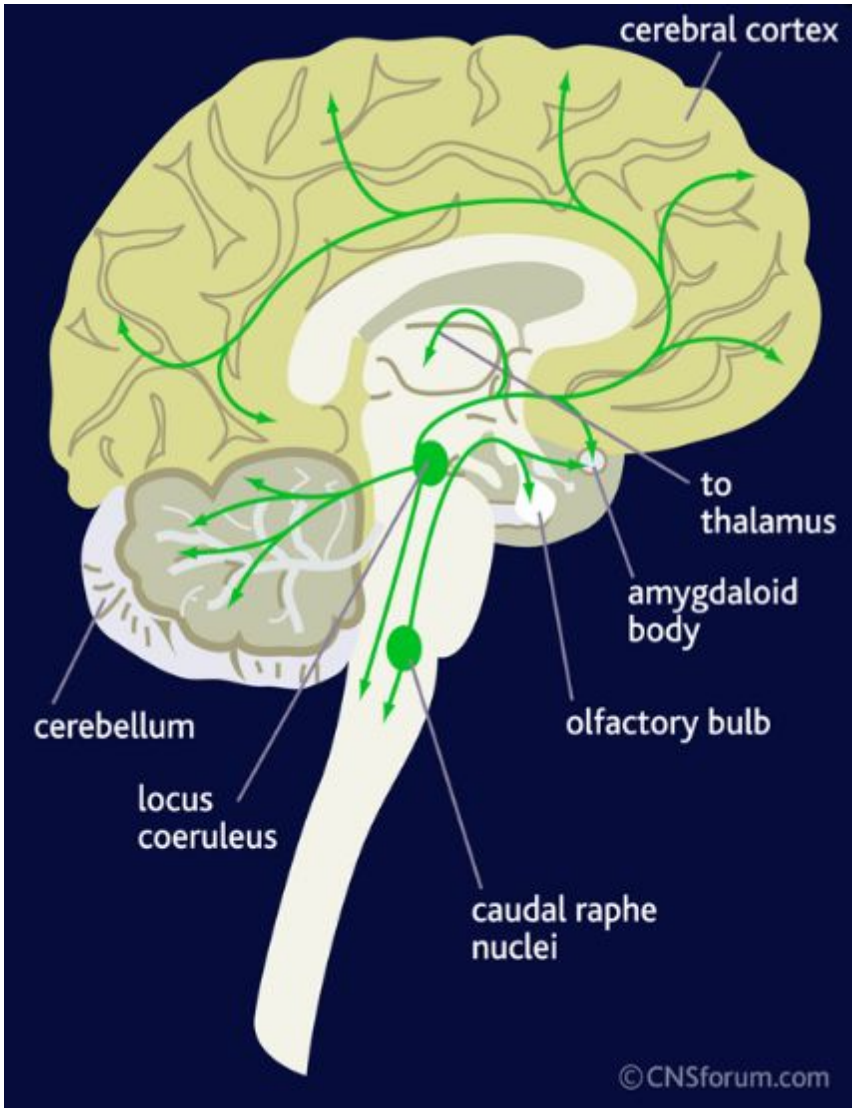
Dopamine is transmitted via three major pathways. The first extends from the substantia nigra to the caudate nucleus-putamen (neostriatum) and is concerned with sensory stimuli and movement. The second pathway projects from the ventral tegmentum to the mesolimbic forebrain and is thought to be associated with cognitive, reward and emotional behavior. The third pathway, known as the tubero-infundibular system, is concerned with neuronal control of the hypothalmic-pituatory endocrine system.

Serotonin (5-HT)



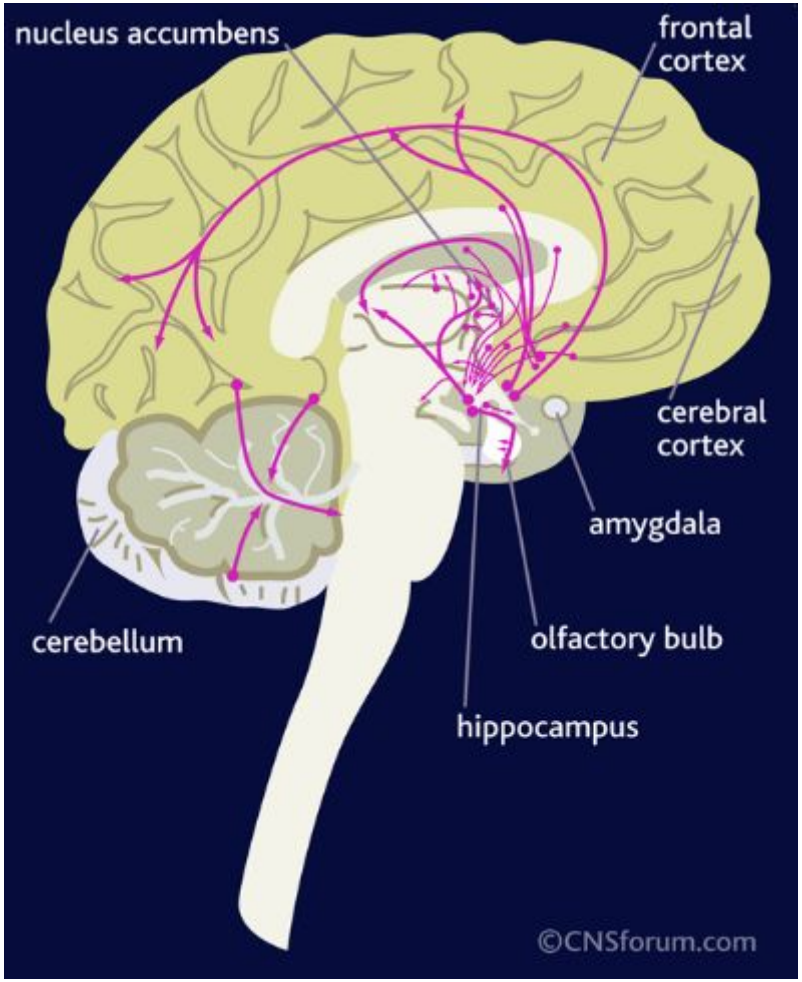
The principal centers for **serotonergic** neurons are the rostral and caudal raphe nuclei. From the rostral raphe nuclei axons ascend to the cerebral cortex, limbic regions and specifically to the basal ganglia. Serotonergic nuclei in the brain stem give rise to descending axons, some of which terminate in the medulla, while others descend the spinal cord.

Norepinephrine (NE)



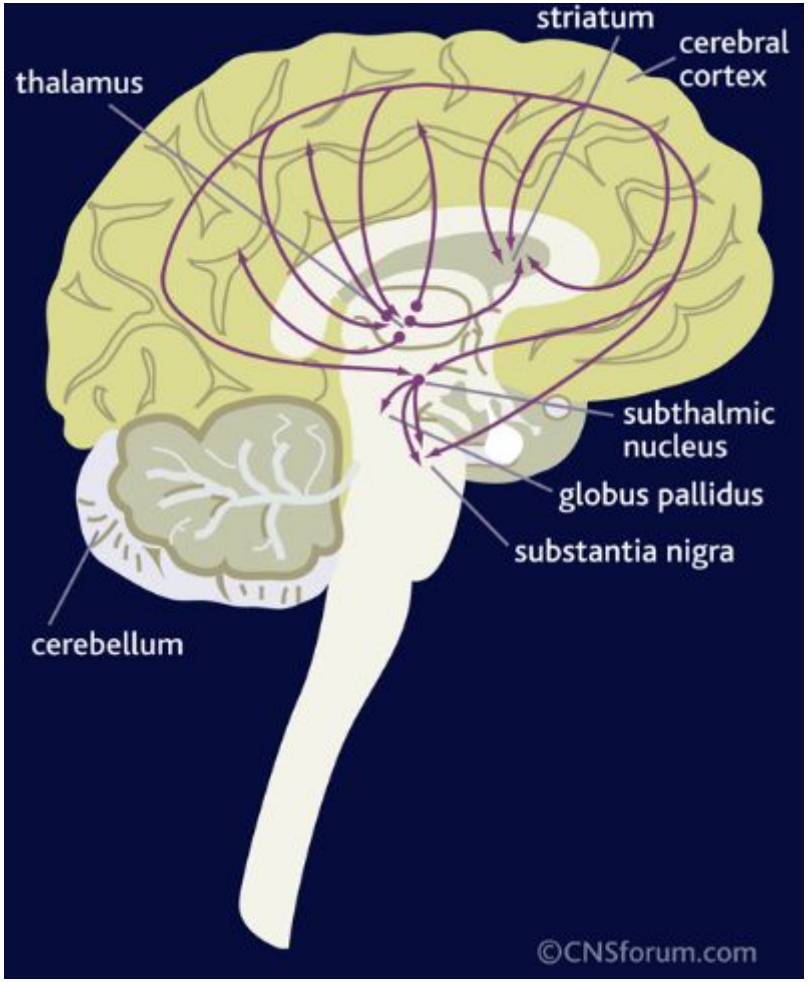
Many regions of the brain are supplied by the **noradrenergic** systems. The principal centers for noradrenergic neurons are the locus coeruleus and the caudal raphe nuclei. The ascending nerves of the locus coeruleus project to the frontal cortex, thalamus, hypothalamus and limbic system. Noradrenaline is also transmitted from the locus coeruleus to the cerebellum. Nerves projecting from the caudal raphe nuclei ascend to the amygdala and descend to the midbrain.

Gamma-aminobutyric acid (GABA)



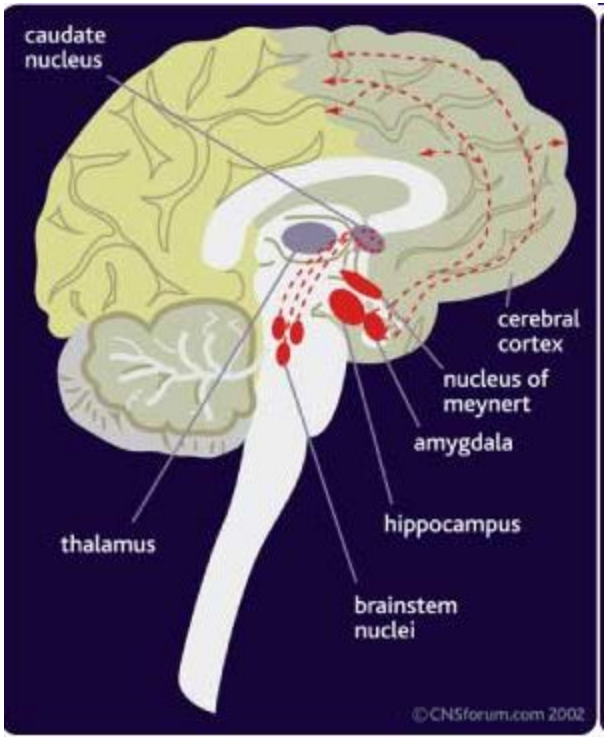
GABA is the main inhibitory neurotransmitter in the central nervous system (CNS). GABAergic inhibition is seen at all levels of the CNS, including the hypothalamus, hippocampus, cerebral cortex and cerebellar cortex. As well as the large well-established GABA pathways, GABA interneurons are abundant in the brain, with 50% of the inhibitory synapses in the brain being GABA mediated.

Glutamate



In the normal brain the prominent **glutamatergic** pathways are: the cortico-cortical pathways; the pathways between the thalamus and the cortex; and the extrapyramidal pathway (the projections between the cortex and striatum). Other glutamate projections exist between the cortex, substantia nigra, subthalmic nucleus and pallidum. Glutamate-containing neuronal terminals are ubiquitous in the central nervous system and their importance in mental activity and neurotransmission is considerable.

Acetylcholine (Ach)

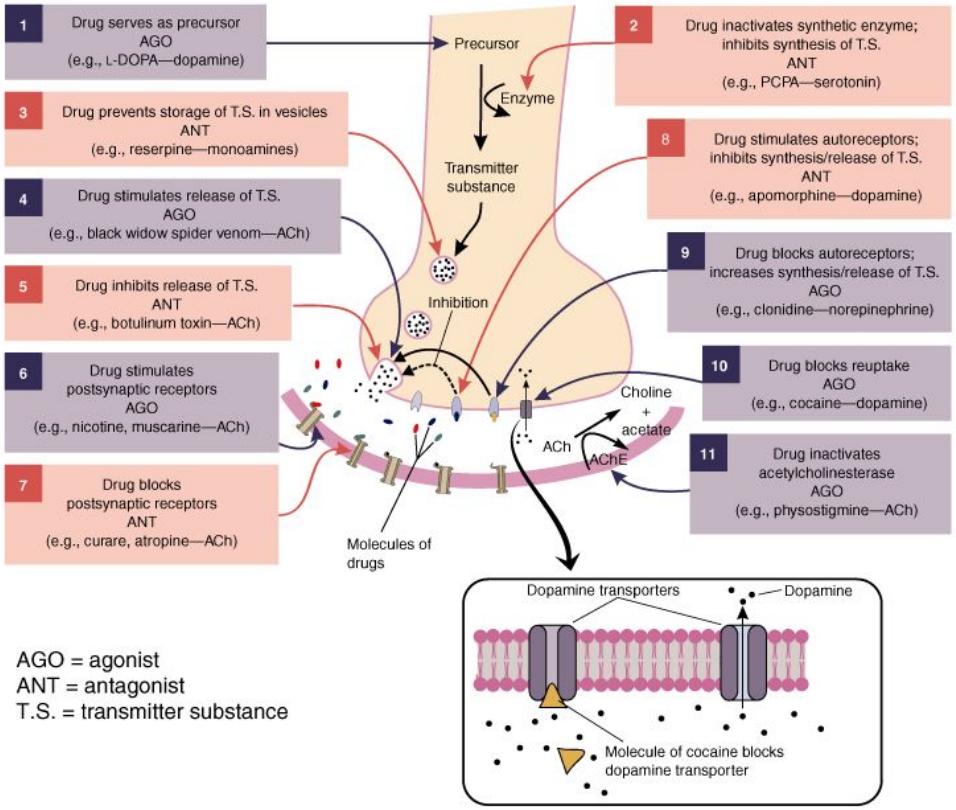


There are three **Acetylcholine** pathways in the CNS. (a) The Pons to thalamus and cortex, (b) Magnocellular forebrain nucleus to cortex, & (c) Septohippocampal. In the central nervous system, ACh has a variety of effects as a neuromodulator upon plasticity, arousal and reward. ACh has an important role in the enhancement of sensory perceptions when we wake up and in sustaining attention.

ACh has also been shown to promote REM sleep

Transmission

► **Summary of the Ways Drugs Affect the Synaptic Transmission**



Research, Use, & Age

>6 months –diazepam (Valium), chlorpromazine (Thorazine)

>2 yrs –Valproate (Depakene), lamotrigine (Lamictal) (for seizures)

>3 yrs – hydroxyzine (Atarax), dextroamphetamine (Dexedrine)

>5yrs- imipramine (Tofranil) (for enuresis)

>5 yrs –risperidone (Risperdal), autistic disorder with irritability

>6 yrs – atomxetine (Strattera), methylphenidate (Ritalin), sertraline (Zoloft)

Research, Use, & Age (cont)

>7yrs- fluoxetine (Prozac)

>8yrs- fluvoxamine (Luvox)

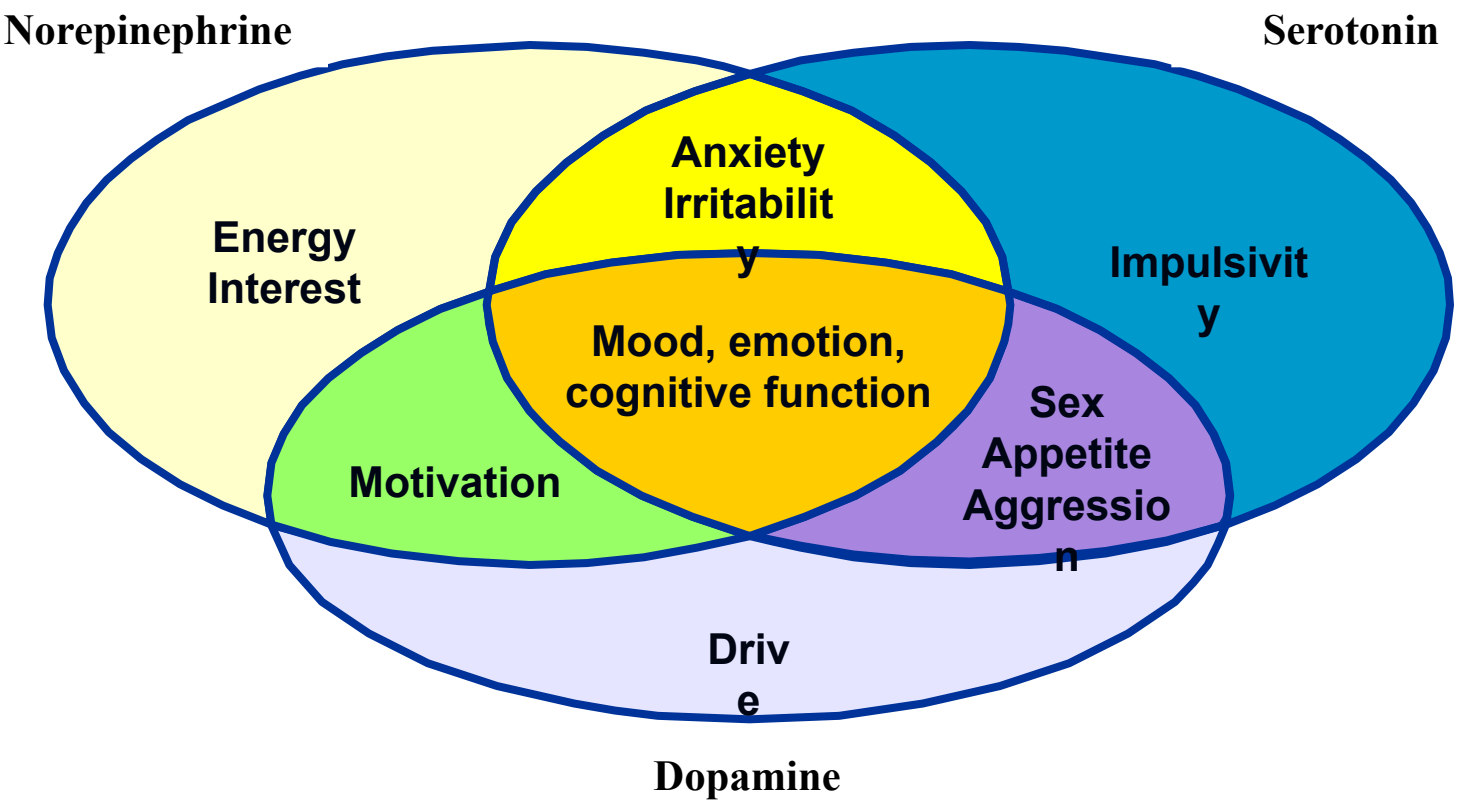
>10 yrs –risperidone, bipolar mania

>13 yrs-risperidone, Schizophrenia

>12 yrs old – thiothixene (Navane), molindone (Moban), perphenazine (Trilafon), Clonidine (Catapres), Lithium, lorazepam (Ativan), amitryptilline (Elavil)

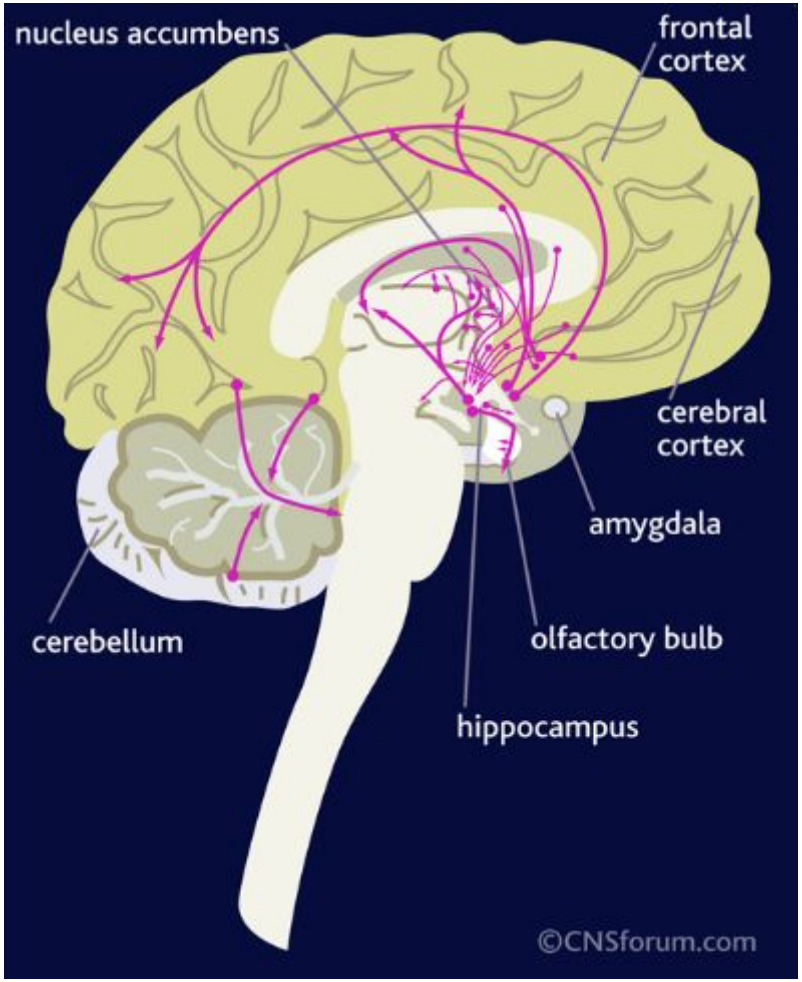
Unspecified – thioridazine (Mellaril), trifluoperazine (Stelazine), carbamazepine (Tegretol)

Several Neurotransmitters Are Involved in Regulating Mood



Stahl SM. *Essential Psychopharmacology: Neuroscientific Basis and Practical Applications*. 2nd ed. Cambridge, UK: Cambridge University Press; 2000:152.

Gamma-aminobutyric acid (GABA)



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Antianxiety Agents

GABA receptors

Valium (diazepam)

Ativan (lorazepam)

Klonopin (clonazepam)

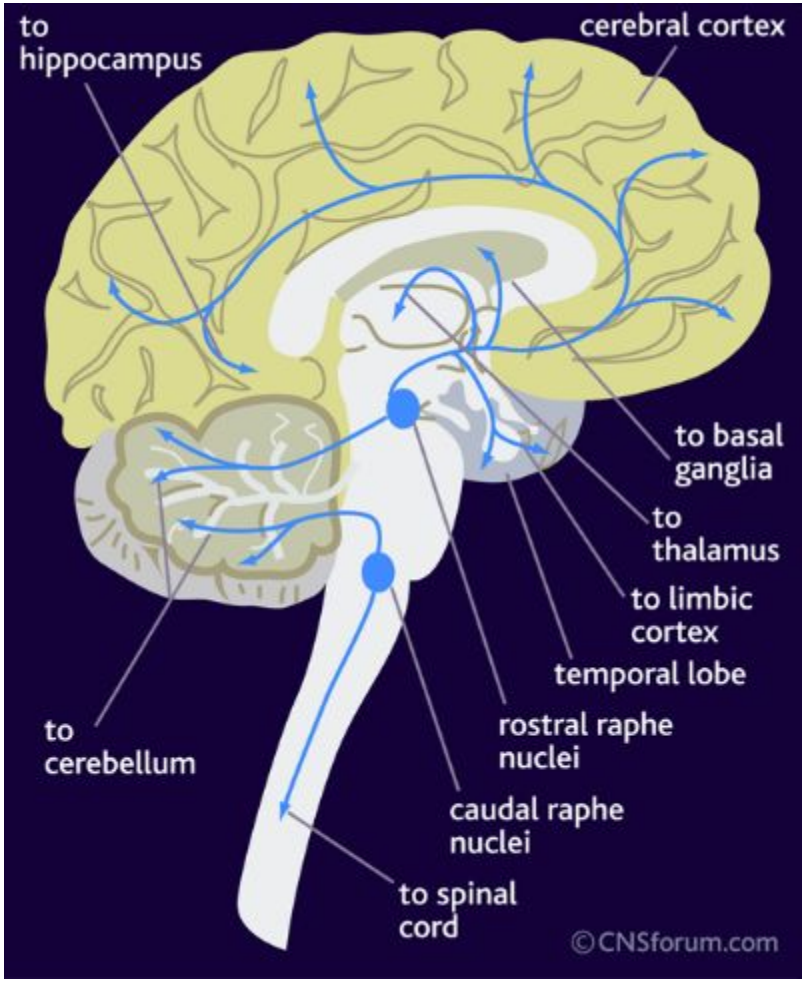
Xanax (alprazolam)

Antianxiety Agents (cont)

Valium/Ativan/Klonopin/Xanax

- Clumsiness
- Sleepiness
- Dizziness
- Irritability
- Unsteadiness
- Confusion
- Problems with memory

Serotonin (5-HT)



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Antianxiety Agents (cont)

5HT Receptors

Buspar (buspirone)

MISC (MOA unknown)

Atarax (hydroxizine HCl)

Vistaril (hydroxizine pamoate)

Antianxiety Agents (cont)

5HT

Buspar

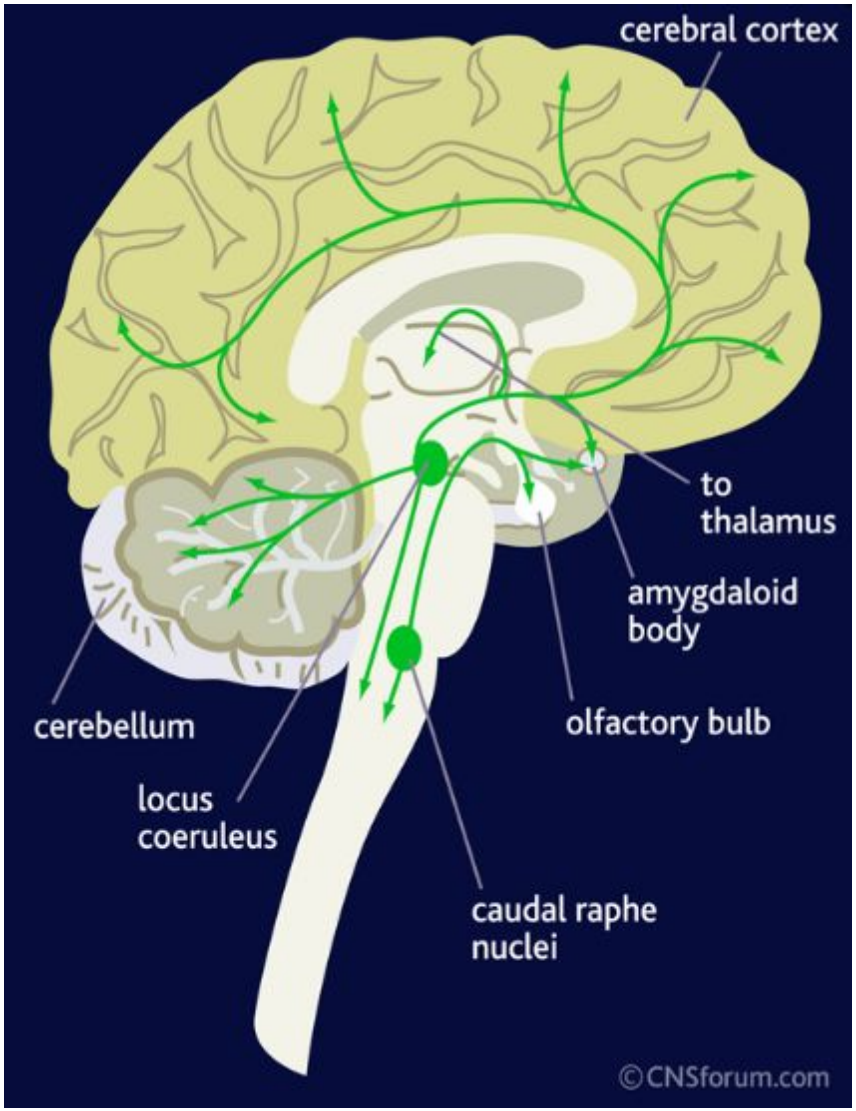
Confusion, Dizziness, Disinhibition, Drowsiness

MISC

Atarax/Vistaril

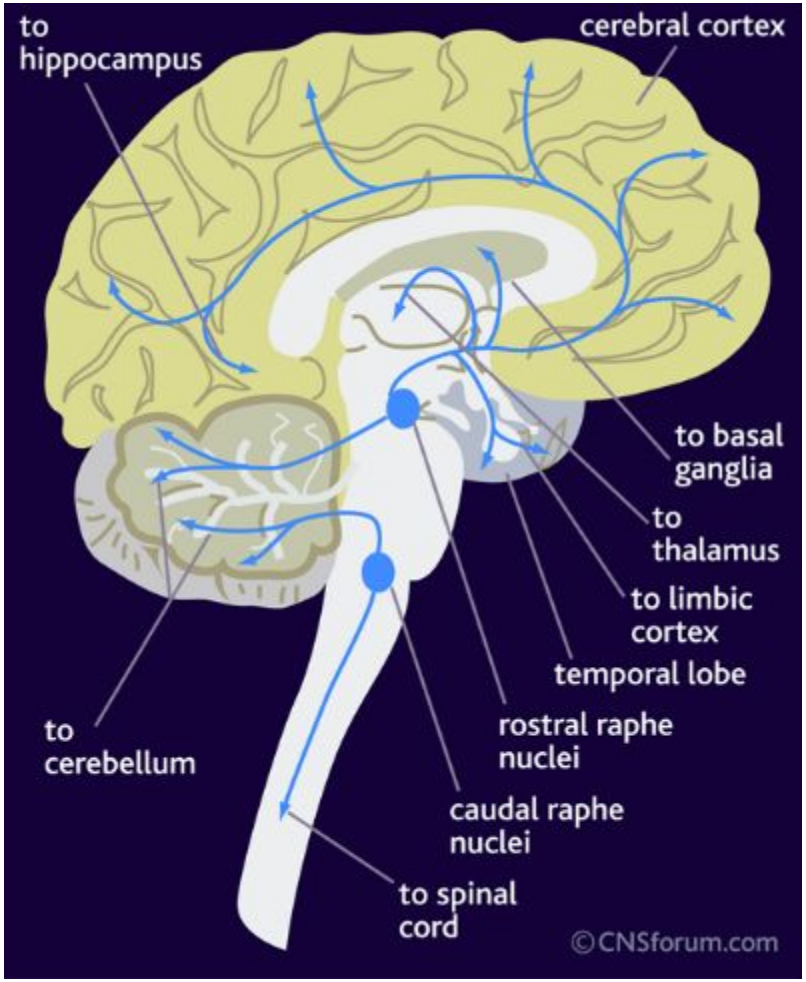
Cognitive Impairments, Sedation, Blurred Vision

Norepinephrine (NE)



Many regions of the brain are supplied by the **noradrenergic** systems. The principal centers for noradrenergic neurons are the locus coeruleus and the caudal raphe nuclei. The ascending nerves of the locus coeruleus project to the frontal cortex, thalamus, hypothalamus and limbic system. Noradrenaline is also transmitted from the locus coeruleus to the cerebellum. Nerves projecting from the caudal raphe nuclei ascend to the amygdala and descend to the midbrain.

Serotonin (5-HT)



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Antidepressants

TCA (NE and/or 5HT reuptake presynaptic)

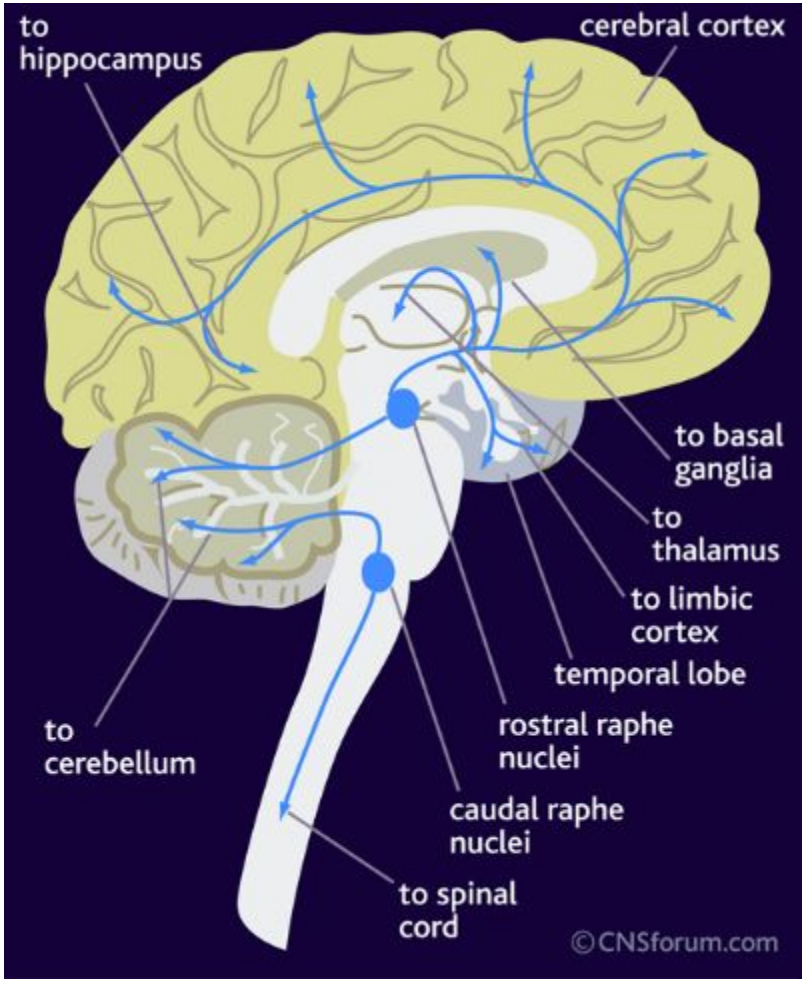
Elavil (amitriptyline)
Asendin (amoxapine)
Anafranil (clomipramine)
Norpramin (desipramine)
Sinequan (doxepin)
Tofranil (imipramine)
Pamelor/Aventyl (nortriptyline)
Vivactil (protriptyline)
Surmontil (trimipramine)

Antidepressants (cont)

TCA
Elavil/Tofranil/Pamelor

Fatigue
Drowsiness/Insomnia
Mild Tremors
Nightmares
Restlessness
Confusion

Serotonin (5-HT)



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Antidepressants (cont)

SSRI (selective seratonin reuptake inhibitors)

Celexa (citalopram)
Lexapro (escitalopram)
Prozac/Sarafem (fluoxetine)
Paxil (paroxetine)
Zoloft (sertraline)
Luvox (fluvoxamine)
Viibryd (vilazodone)

Antidepressants (cont)

SSRI

Celexa/Prozac/Paxil/Zoloft/Lexapro/Viibryd

Agitation

Nervousness

Fatigue

Sleep Problems

Vertigo

Sexual Side Effects

Antidepressants (cont)

MAOI (monoamine oxidase inhibitors)

Nardil (phenelzine)

Parnate (tranylcypromine)

Marplan (isocarbozide)

Antidepressants (cont)

MAOI

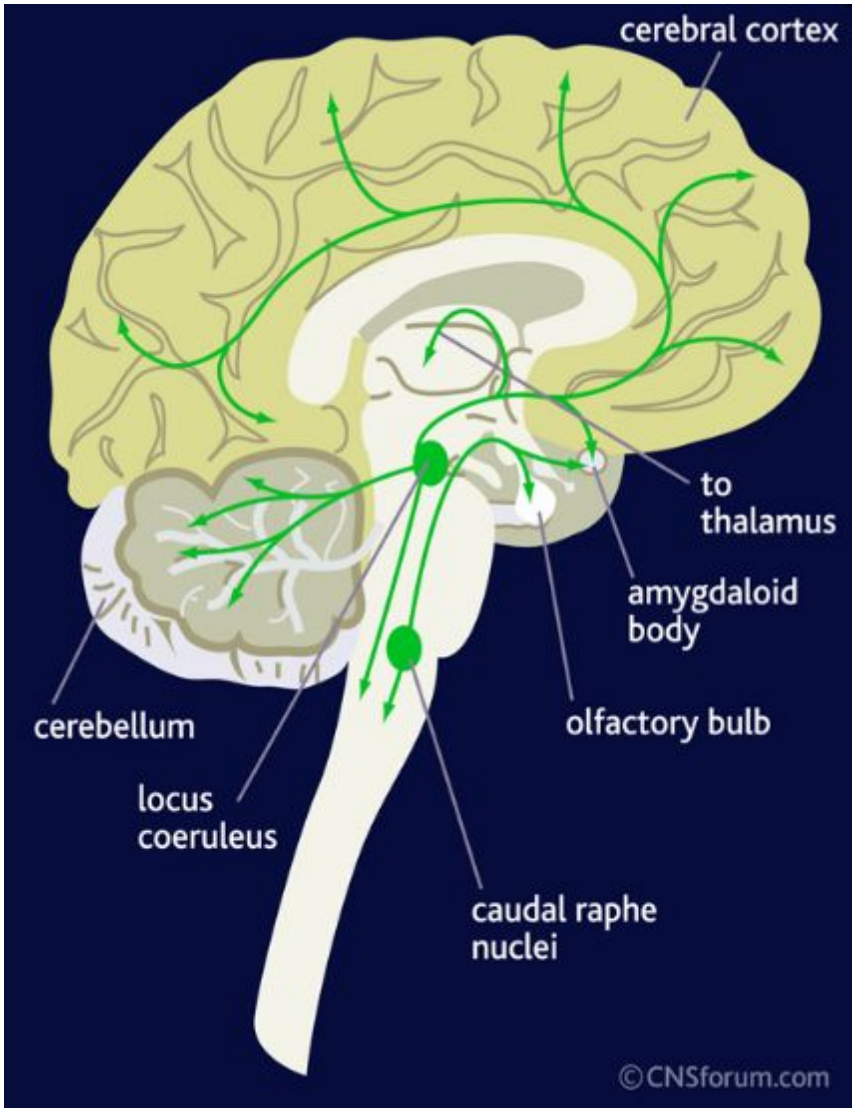
Nardil/Parnate/Marplan

Dizziness

Headache

Sleep Problems

Norepinephrine (NE)



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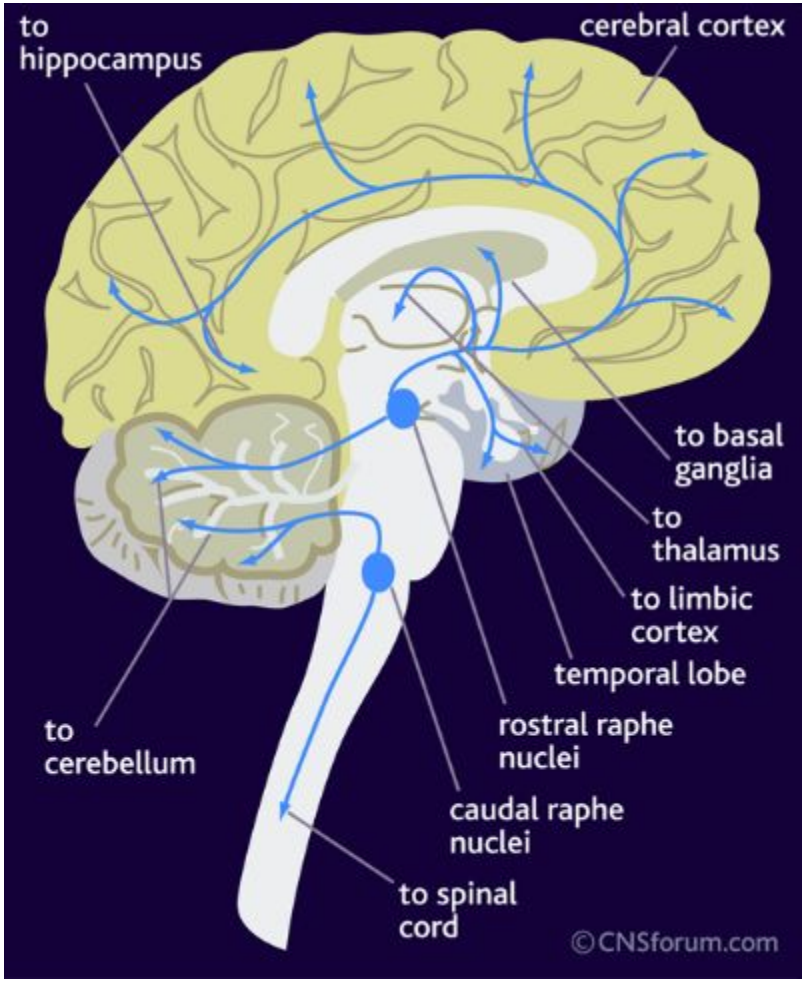

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Antidepressants (cont)

MISC (MOA unclear)

Desyrel (trazodone)
Wellbutrin/Zyban (bupropion)
Effexor (venlafaxine)
Serzone (nefazodone)
Cymbalta (duloxetine)
Pristiq (desvenlafaxine)
Remeron (mirtazepine)

Antidepressants (cont)

MISC

Desyrel/Wellbutrin/Effexor/Serzone/Cymbalta/ Pristiq/Remeron

Agitation
Drowsiness
Sleep Disturbance
Strange Dreams
Increased Blood Pressure

,

Intake

Gathering Information

Initial Treatment Plan

Gathering Information

The Initial Play Therapy Session

Observation: Medication Symptoms/Impact

Behavioral Changes

Cognitive Changes

Emotional Changes

Intake

Past medications: List, in chronological order, all **psychotropic** medications the individual took in the past. If the list is long, print it separately and bring it to your appointment.

Age	Medication Name	Dose	Comments

Intake

Current medications: List, in chronological order, all **psychotropic** medications the individual is currently taking. Don't forget about over-the counter medications.

Age	Medication Name	Dose	Comments

Medication/Behavioral/Cognitive/Emotional/Developmental Time Line

The Initial Treatment Plan

- How will you address medication side effect(s) as part of the therapeutic process?
- Can you link a skill/activity/technique to a side effect and reduce its impact on therapy?
- What can you do to accomplish side effect reduction as well as therapeutic progress?

Medication Side Effect	Goals/Objectives	Interventions

Addressing Medication Side Effects in the Treatment Plan

4 Presentation Types, Each Requires Something Different

The Warm Up

The Cool Down

The Warm Up-Cool Down

The Cool Down-Cool Down

Left and Right Brain

LEFT BRAIN FUNCTIONS
uses logic
detail oriented
facts rule
words and language
present and past
math and science
can comprehend
knowing
acknowledges
order/pattern perception
knows object name
reality based
forms strategies
practical
safe

RIGHT BRAIN FUNCTIONS
uses feeling
"big picture" oriented
imagination rules
symbols and images
present and future
philosophy & religion
can "get it" (i.e. meaning)
believes
appreciates
spatial perception
knows object function
fantasy based
presents possibilities
impetuous
risk taking

Working with Lethargy in Play Therapy

Slow Down

Experiential Activities

Arts and Crafts

Working with Lethargy in Play Therapy (cont)

If you have an outdoor space:

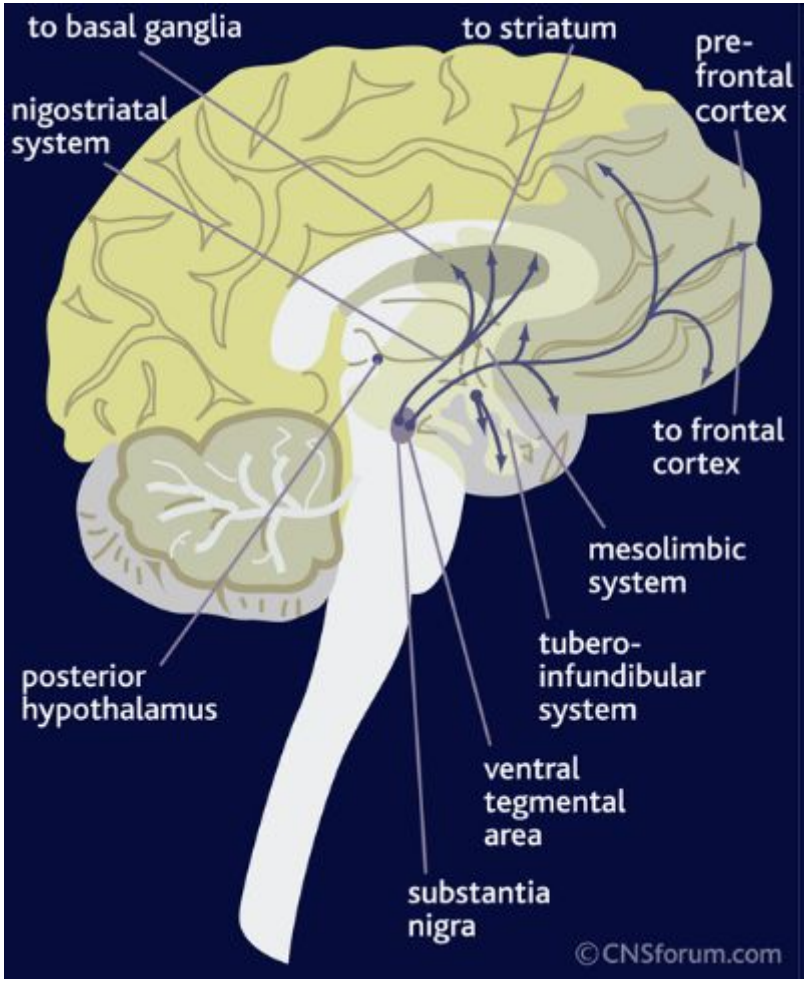
Consider the benefits of “fresh air and natural sunlight”

Walks

Hop Scotch

Swinging

Dopamine (DA)



Dopamine is transmitted via three major pathways. The first extends from the substantia nigra to the caudate nucleus-putamen (neostriatum) and is concerned with sensory stimuli and movement. The second pathway projects from the ventral tegmentum to the mesolimbic forebrain and is thought to be associated with cognitive, reward and emotional behavior. The third pathway, known as the tubero-infundibular system, is concerned with neuronal control of the hypothalmic-pituatory endocrine system.

Antipsychotics

Phenothiazine Derv. (DA receptor antagonist)

Thorazine (Chlorpromazine)
Prolixin (fluphenazine)
Serentil (mesoridazine)
Trilafon (perphenazine)
Compazine (prochlorperazine)
Stelazine (trifluoperazine)
Mellaril (thioridazine)

Antipsychotics (cont)

Phenothiazine derv.

Thorazine/Stelazine/Mellaril

Akathisia
Akinesia
Sleepiness
Cognitive Blunting
Stiffness

Antipsychotics (cont)

Phenylbutylpiperadine derv.

Haldol (haloperidol)

Orap (pimozide)

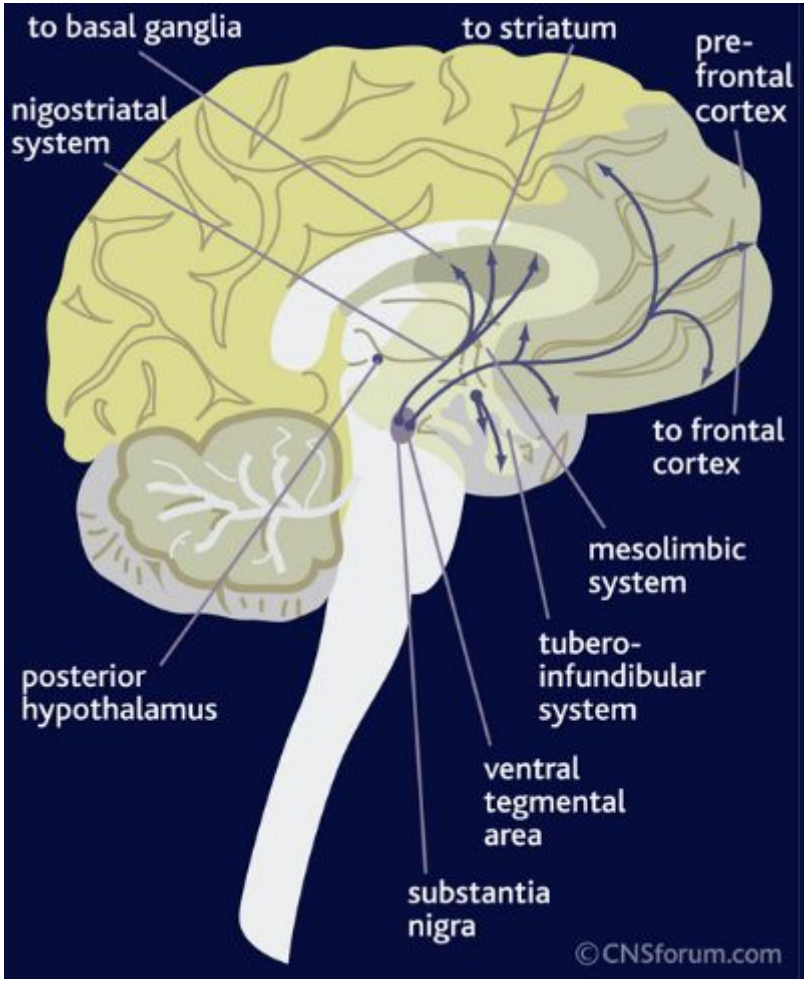
Antipsychotics (cont)

Phenylbutylpiperadine derv.

Haldol/Orap

Akathisia
Akinesia
Blurred Vision
Sleepiness
Cognitive Blunting

Dopamine (DA)



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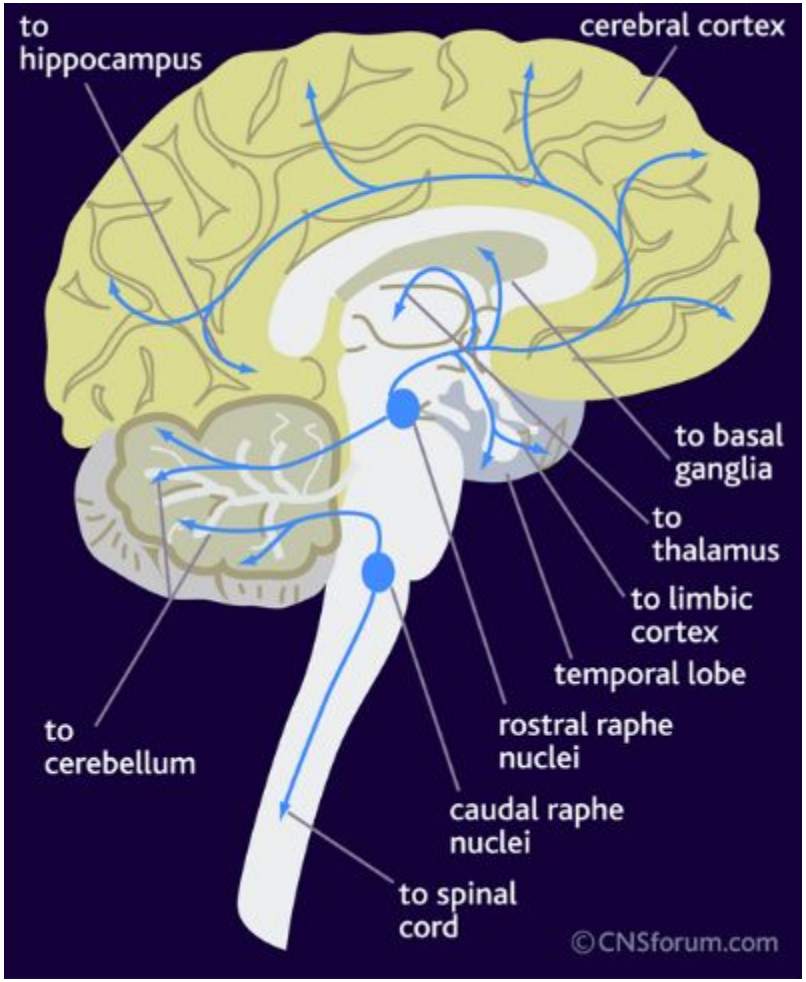
Serotonin (5-HT)



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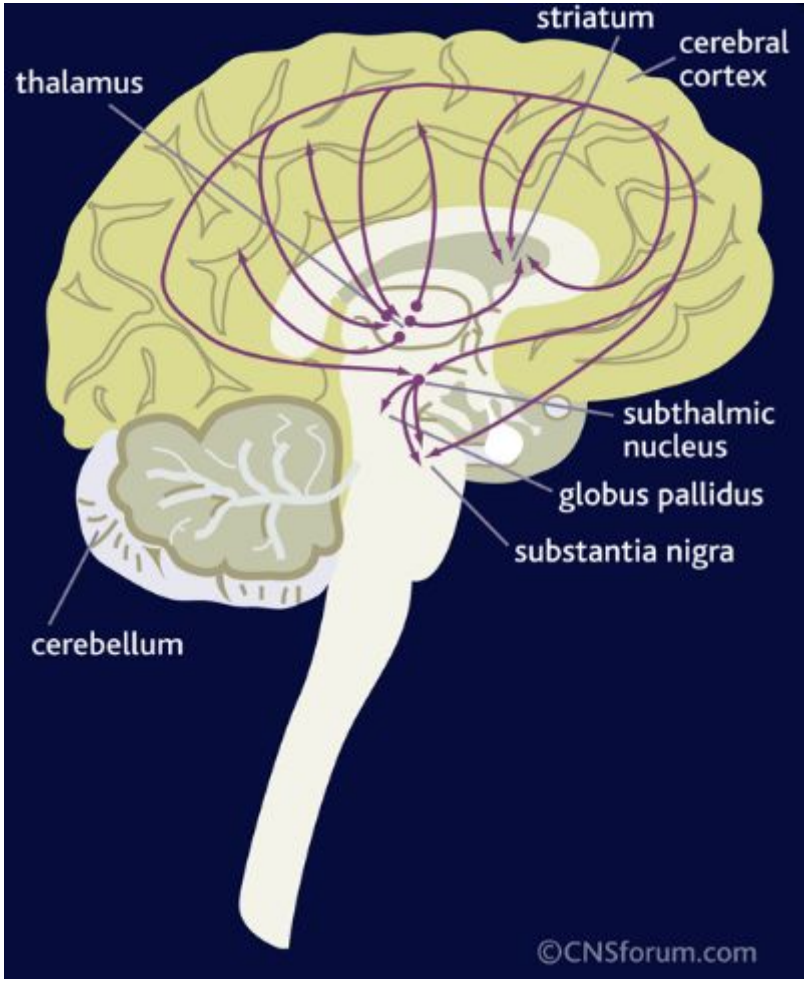
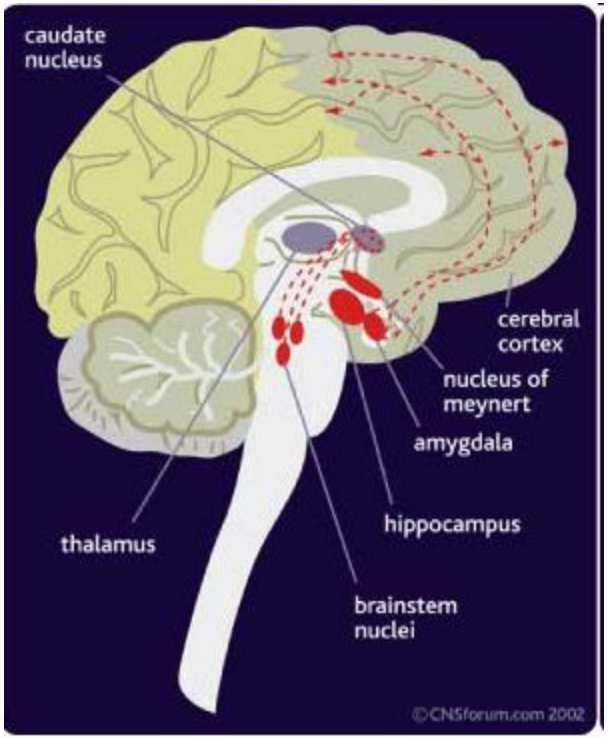
Glutamate



In the normal brain the prominent **glutamatergic** pathways are: the cortico-cortical pathways; the pathways between the thalamus and the cortex; and the extrapyramidal pathway (the projections between the cortex and striatum). Other glutamate projections exist between the cortex, substantia nigra, subthalmic nucleus and pallidum. Glutamate-containing neuronal terminals are ubiquitous in the central nervous system and their importance in mental activity and neurotransmission is considerable.

Acetylcholine (Ach)



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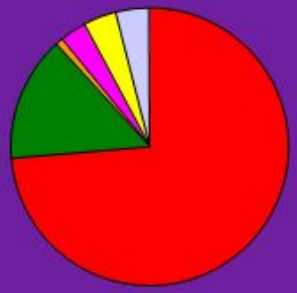
ACh has also been shown to promote REM sleep

Relative Receptor Binding Profiles: ZYPREXA Among Other Antipsychotic Drugs

Haloperidol



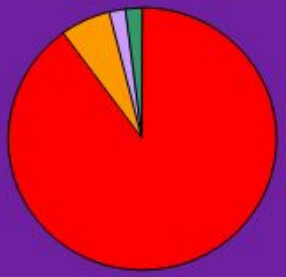
Risperidone

Olanzapine

Quetiapine

Ziprasidone

Aripiprazole



Clozapine

Data based on both animal and human receptors. *In vitro* findings may not correlate with clinical efficacy.

For additional safety profile, see Important Safety Information slides and the full Prescribing Information.
For safety profiles of other products, see respective manufacturers' package inserts.

Bymaster FP, et al. *Neuropsychopharmacology* 1996;14(2):87-96.
Schotte A, et al. *Psychopharmacology (Berl)* 1996;124(1-2):57-73.

ZYPREXA® Olanzapine

Antipsychotics (cont)

Dibenzapine derv.

Loxitane (loxapine)
Zyprexa (olanzapine)
Seroquel (quetiapine)

Benzisoxazole derv.

Risperdal (risperidone)

Antipsychotics (cont)

Dibenzapine derv.

Loxitane/Zyprexa/Seroquel

Sedation
Cognitive Blunting

Benzisoxazole derv.

Risperdal

Drowsiness, Dizziness, Cognitive Blunting, Movement Disorders

Antipsychotics (cont)

Dihydroindolones

Geodone (ziprasidone)

Moban (molindone)

Quinolinone

Abilify (aripiprazole)

Benzoisothiazol derv.

Latuda (lurasidone)

MISC

Eskalith/Lithobid (lithium)

Antipsychotics (cont)

Dihydroindolones

Geodone/Moban

Sleepiness
Confusion

Quinolinone

Abilify

Confusion

Benzoisothiazol derivatives

Latuda (lurasidone)

Drowsiness
An internal restless or jittery feeling (akathisia)
Movement or muscle disorders
Insomnia

MISC

Lithium

Tremors

Working With Cognitive Cloudiness in Play Therapy

Slow Down

Consider the benefits of “fresh air and natural sunlight”

Working With Cognitive Cloudiness in Play Therapy (cont)

Simple Games (still require an attempt to focus)

Matching Games

Card Games

Working With Cognitive Cloudiness in Play Therapy (cont)

Puzzles

Mazes

Guessing Games

Hangman

Working With Emotional Blunting in Play Therapy

Rhythm

Music

Dance

Bibliotherapy

Working With Emotional Blunting in Play Therapy (cont)

Emotions Tic Tac Toe

Emotions Identification

Emotion Cards—identification and act out

Facial Expressions

Working With Emotional Blunting in Play Therapy (cont)

Art—Guided or Abstract

Jokes

Cartoons

Working with Coordination Difficulties in Play Therapy

Practice

Use Rhythm

Increase speed/intensity

Gross Motor Skills

Involve the following in Play Therapy:

Crafts

Finger Paints

Hula Hoops

Gross Motor Skills (cont)

Involve the following in Play Therapy:

Things that can be manipulated, stacked, etc. but are larger.

Legos
Blocks
Dominos
Marbles
Jenga

Fine Motor Skills

Involve the following in Play Therapy:

Things that can be manipulated, stacked, etc. but are smaller.

Pick up Sticks
Tiddlywinks
The game “Operation”
Ring Toss Games
Fishing Games

Fine Motor Skills (cont)

Crafts which include:

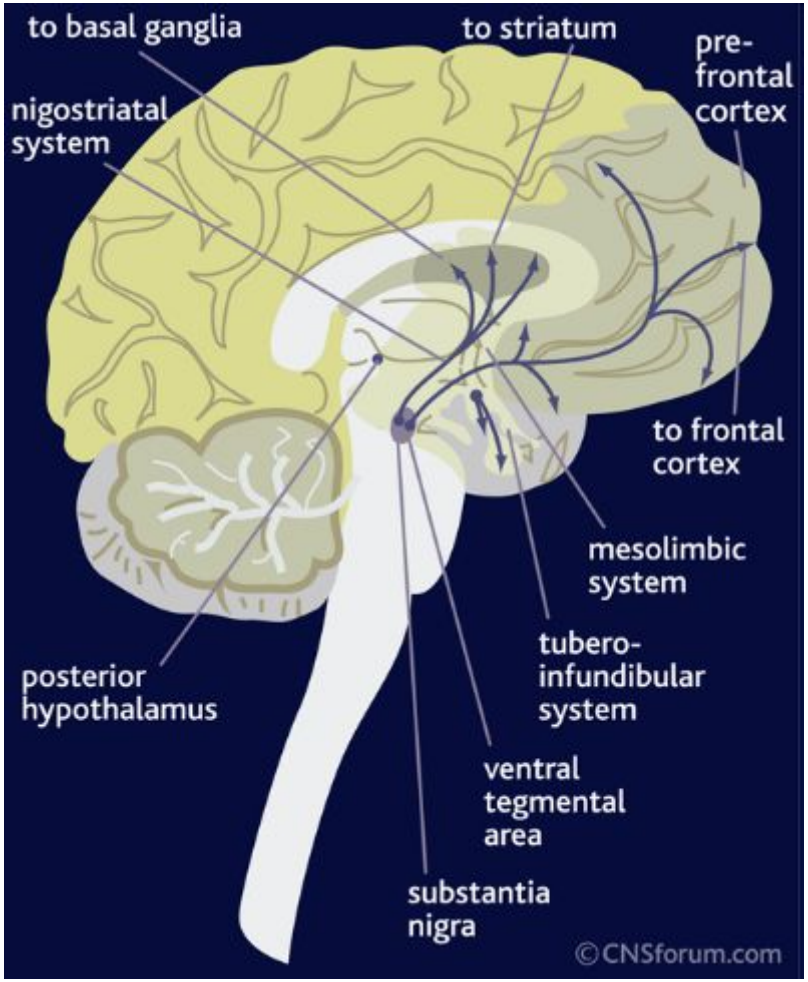
Beads

Macaroni/Shaped Pasta

Other Things

Consult or get to know an Occupational Therapist

Dopamine (DA)



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CNS Stimulants

Analeptic

Provigil (modafinil)

Amphetamines

Dexedrine (dextroamphetamine)

Desoxyn (methamphetamine)

Adderall (amphetamine mixture)

Vyvanse (lisdexamfetamine)

CNS Stimulants (cont)

Analeptic

Provigil

Irritability

Amphetamines

Adderall/Dexedrine/Desoxyn/Vyvanse

Agitation/Aggression

Sleep Problems

Nervousness

Restlessness

Adderall more likely to create some mood lability and irritability than the other stimulant medications.

CNS Stimulants (cont)

Non-Amphetamines

Ritalin/Concerta/Metadate/Methylin (methylphenidate)

Cylert (pemoline)

Focalin (dexmethylphenidate)

Daytrana (methylphenidate)---Patch

CNS Stimulants (cont)

Non-Amphetamines

Ritalin/Concerta/Daytrana/Metadate/Methylin

Sleep Problems
Nervousness
Agitation/Aggression

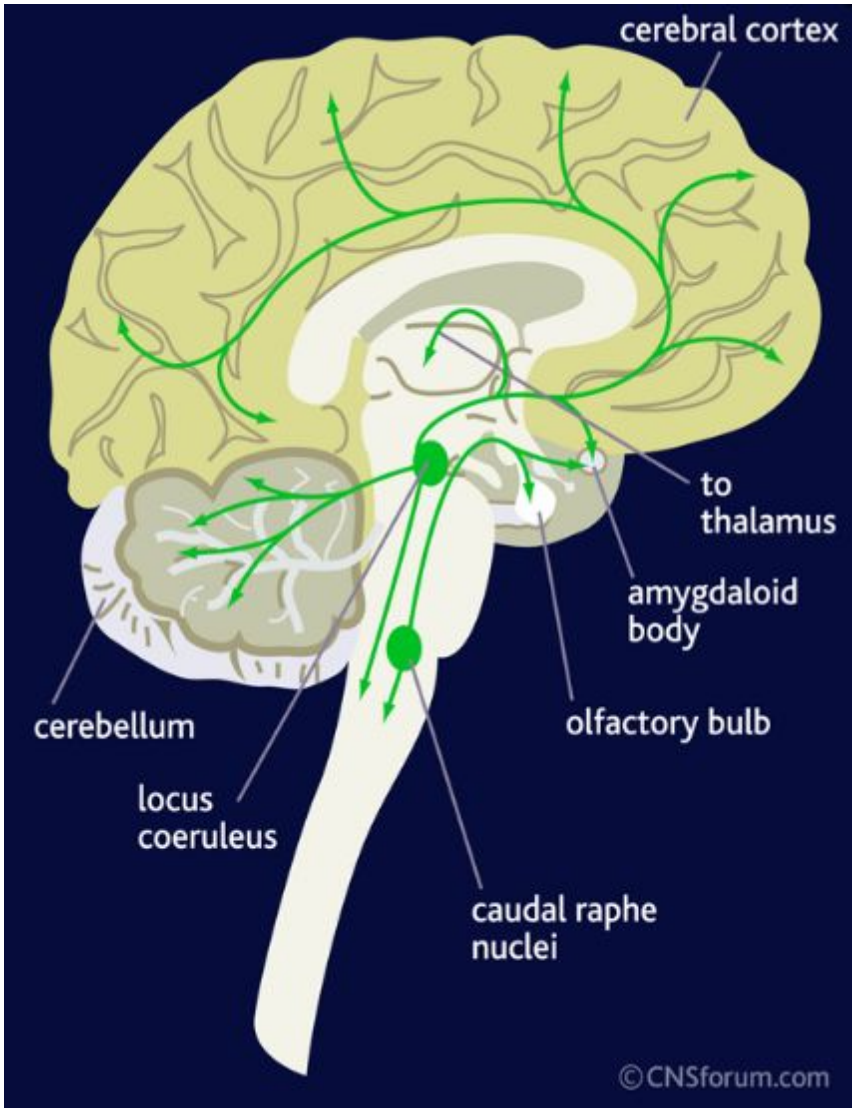
Cylert

Insomnia
Depression
Irritability

Focalin

Nervousness
Sleep Problems

Norepinephrine (NE)



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MISC ADHD Medications

Strattera (atomoxetine) potent inhibitor of presynaptic NE transporter

MISC ADHD Medications (cont)

Strattera

Fatigue

Sleep Disturbance

Working with Agitation/Aggression in Play Therapy

Sandtray or Sand Play

Clay Therapy (Paul White)

Bibliotherapy

Working with Agitation/Aggresion in Play Therapy (cont)

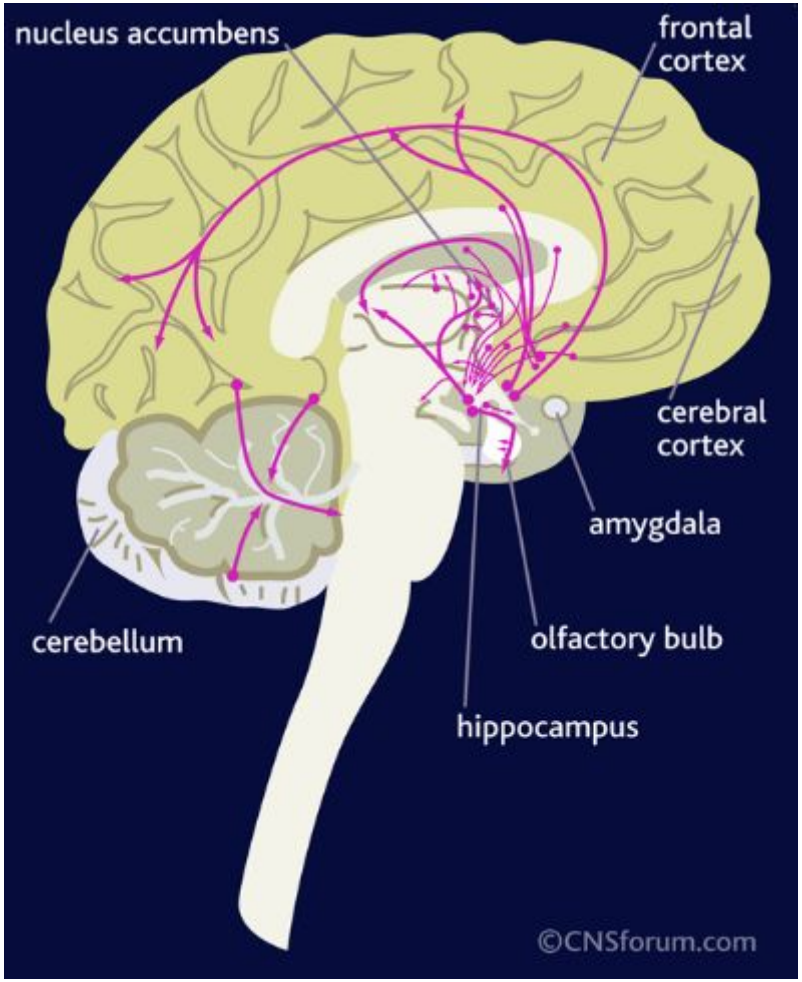
Consider the benefits of “fresh and Natural sun light”

Rhythm

Music

Natural Sounds

Gamma-aminobutyric acid (GABA)



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Sedative/Hypnotics

(GABA)

Newer

Ambien (zolpidem)

ProSom (estazolam)

Lunesta (eszopiclone)

Sonata (zaleplon)

Older

Halcion (triazolam)

Restoril (temazepam)

Sedative/Hypnotics (cont)

GABA

Ambien/Prosom/Lunesta/Sonata/Halcion/Restoril

Fatigue
Clumsiness

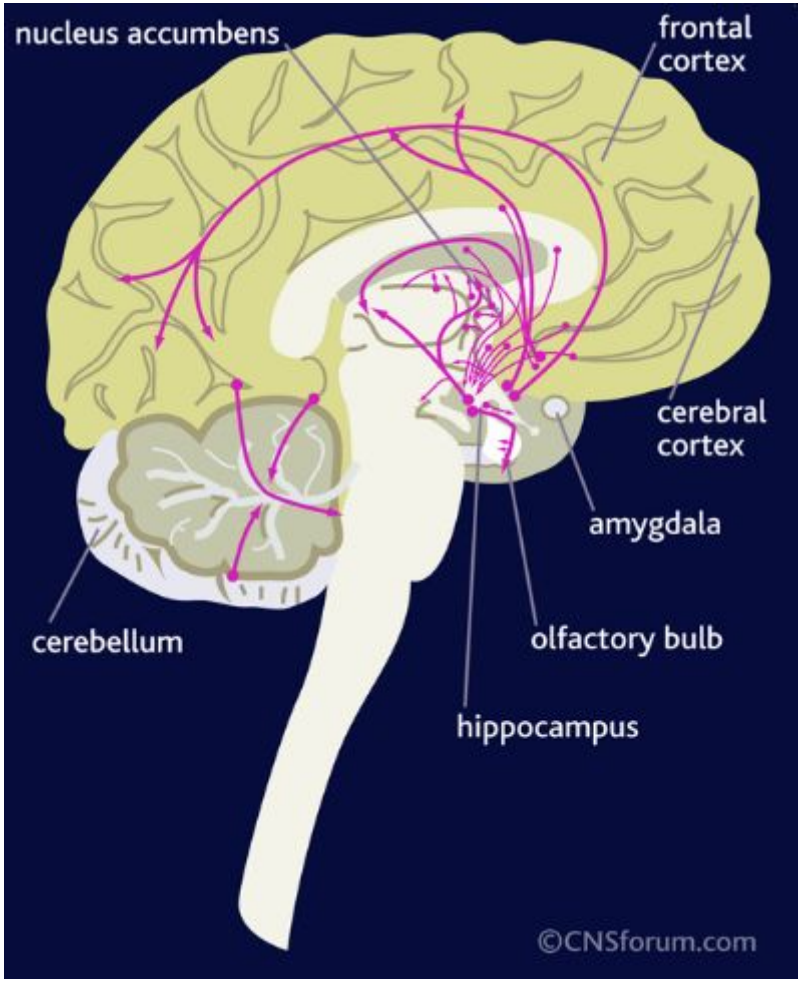
Sedative/Hypnotics (cont)

Melatonin

Rozerem (ramelteon)

Fatigue
Clumsiness

Gamma-aminobutyric acid (GABA)



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Anticonvulsants/Psychiatric Uses

Tegretol/Carbatrol (carbamazepine)

Trileptal (oxcarbazepine)

Neurontin (gabapentin)

Topamax (topiramate)

Depakote/Depakene (valproic acid)

Lamictal (lamotrigine)

Gabitril (tiagabine)

Anticonvulsants/Psychiatric Uses (cont)

Tegretol/Carbatrol

Dizziness, Drowsiness, Blurred Vision

Trileptal/Neurontin/Topamax/Lamictal

Fatigue, Dizziness, Nervousness

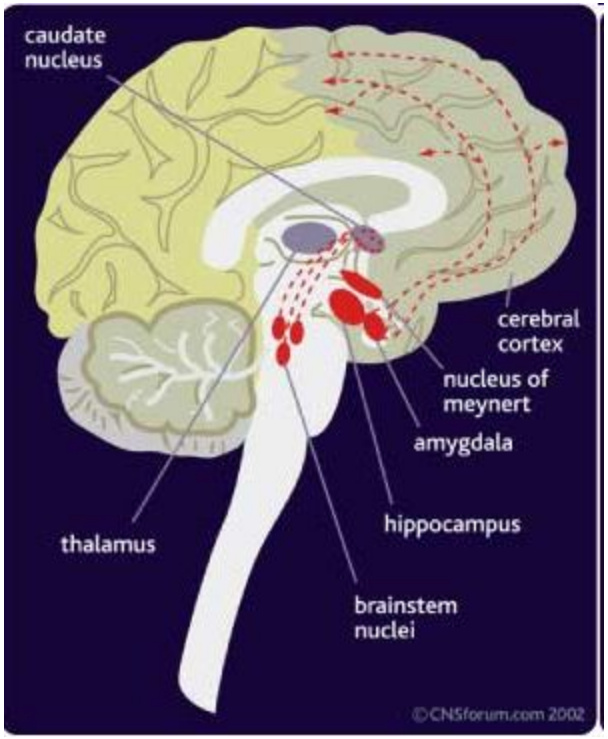
Depakote/Depakene

Drowsiness, Lethargy

Gabitril

Fatigue, dizziness, unstable walking, seizures

Acetylcholine (Ach)



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ACh has also been shown to promote REM sleep

Antiparkinsons/Psychiatric Uses

Cogentin (bentropine)

Artane (trihexyphenidyl)

No major negative effects

MISC MISC MISC/Psychiatric Uses

Benadryl (diphenhyramine)—with older Antipsychotics

Inversine (mecamylamine)---Tourette's

Revia (naltrexone)---Severe Behavioral Disorder in MR, Pervasive Developmental Disorders

MISC MISC MISC Psychiatric Uses (cont)

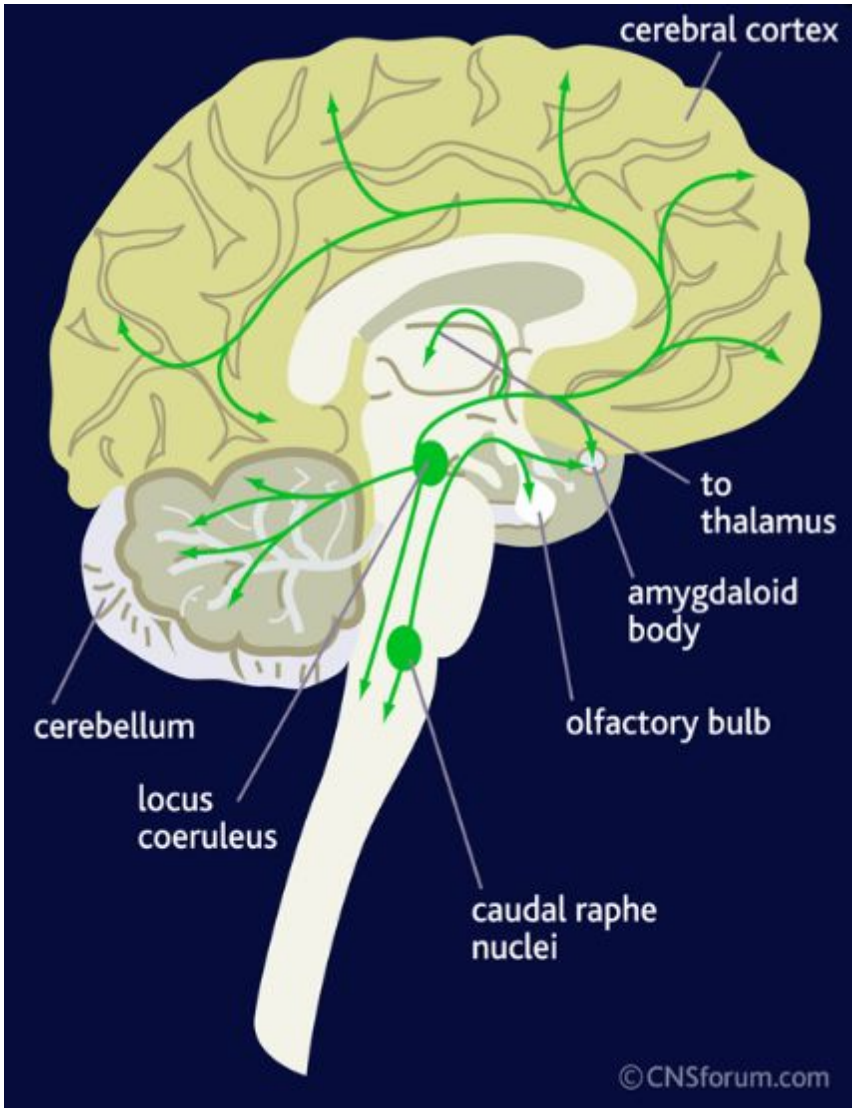
Benadryl

Sedation, Cognitive Impairments

Medication

Antihypertensives

Norepinephrine (NE)



Many regions of the brain are supplied by the **noradrenergic** systems. The principal centers for noradrenergic neurons are the locus coeruleus and the caudal raphe nuclei. The ascending nerves of the locus coeruleus project to the frontal cortex, thalamus, hypothalamus and limbic system. Noradrenaline is also transmitted from the locus coeruleus to the cerebellum. Nerves projecting from the caudal raphe nuclei ascend to the amygdala and descend to the midbrain.

MISC MISC MISC/Psychiatric Uses

Inderal (propranolol)---IED, PTSD

Catapres (clonidine)—ADHD, Conduct Disorder, Tourette's

Tenex/Intuniv (guanfacine)---ADHD, Tourette's

Irritability, Tiredness, Hypotension

Antihypetensives

Inderal (propranolol)
Drowsiness, Hypotension

Catapres (clonidine)
Sedation, Drowsiness, Depression, Irritability, Hypotension

Tenex/Intuniv (guanfacine)
Irritability, Tiredness, Hypotension

Items We Should All Have: They Accomplish Multiple Tasks

Cards

Marbles

Jacks

Dominos

Clay

Sand

Games We Should All Have: They Accomplish Multiple Tasks

Jenga

Pick-up-Sticks

Connect 4

Tic Tac Toe

Operation

Chutes and Ladders

Conclusion

Remember:

The goal is to go slow and be supportive. Allow the child to push past the side effect.

When stimulated the brain/body can overcome/compensate for medication side effects.

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Recommended videos:

Medicating Kids—Frontline (2001)

The Medicated Child—Frontline—(2008)

The Secret Life of the Brain—PBS (2002)

Generation Meds—ABC World News—Diane Sawyer—(2011)—Over Medication of Children in Foster Care

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