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Childhood Rage: Diagnosis and Treatment Strategies for Severe Mood Dysregulation - Part 1: Understanding Rage

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AACC
2013 “Our Time is Now”
World Conference

Pre Conference Workshop 043:
Attachments and Neurobiology:
Helping Children with Anxiety Disorders
and Severe Mood Dysregulation*

* DSM-5: Developmental Mood Dysregulation Disorder

Gary Sibcy, Ph.D. and E. John Kuhnley, M.D.

Childhood Rage:

Diagnosis and Treatment Strategies for Severe Mood Dysregulation

Part 1: Understanding Rage

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OBJECTIVES

- 1) Understand and differentiate the various presentations of rage in children and adolescents.
- 2) Review/learn the interplay of genetics, neurobiology, development, environment, psychological factors, social interaction factors, spiritual factors, and other factors influencing presentation of rage in children and adolescents.
- 3) Identify an integrative treatment approach (medication and non-medication strategies) for conditions presenting with rage (including Oppositional Defiant Disorder, Explosive behavior, Disruptive Mood Dysregulation Disorder, ADHD, Anxiety Disorders, Bipolar Disorder and other mood disorders).

Disclosures: None

30 Years Later

- Was happily married and they have a healthy grown child whom she made certain has **NEVER** had to experience abuse, despite the predictions that abused children like herself often grow up to become abusive themselves
- Successful professional who dedicated herself to helping children, so many of which have experienced abuse.. .And now mourn her loss.
- Died of Cancer in 2013

Clinical Take-Home Messages

- Parents don't tell us everything
- Patients don't tell us everything
- Collateral sources don't tell us everything
- We must obtain information from multiple sources, **LISTEN carefully to the patient's words and behavior**, put it together and figure it out
- Rage and mood swings seldom equate to Bipolar Disorder and may indicate many underlying possibilities

Key Concepts

- Brain-body connection
- Homeostasis / Balance
- Feedback loops
- Upregulation /Downregulation
- Regulation / Dysregulation



ANNOYANCE
DISTRACTION
DISAPPOINTMENT



FRUSTRATION
IRRITATION
AGITATION



ANGER
RAGE
FURY



ANGER

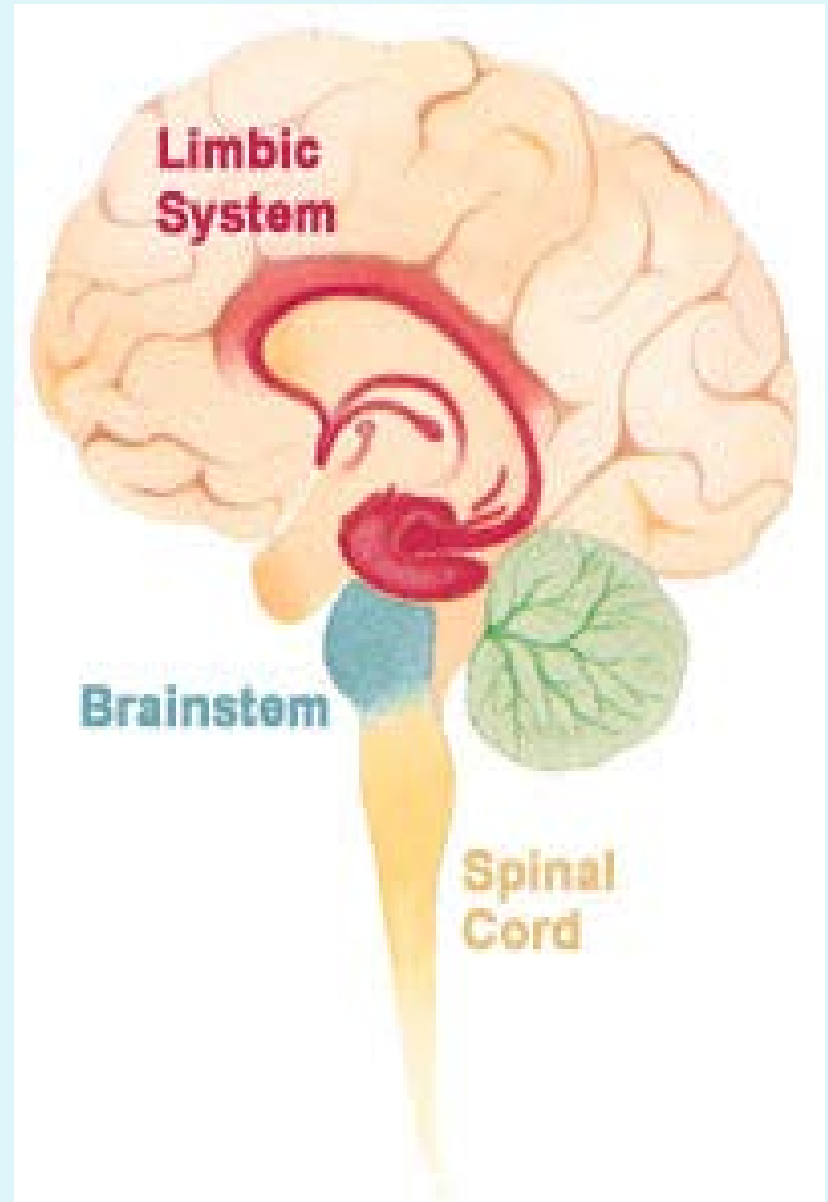
- A normal emotion in reaction to perceived:
 - **Threat of harm** to self, others, property
 - Incitement of the fight/fight/freeze response
 - **Being wronged**, offended, challenged, shamed, or unfairly treated or witnessing such
- Types of anger include:
 - Situational / episodic
 - Dispositional / characterological
 - Purposeful / manipulative

ANGER

- Anger may cause a loss in self-monitoring capacity and objective observability AND may result from deficits in these skills
- Anger may be internalized or externalized
- Anger may have physical correlates such as increases in heart rate, blood pressure, and levels of adrenaline and noradrenaline.

- Structures including:
 - Hippocampus,
 - Amygdala
 - Anterior thalamic nuclei,
 - Septum
 - Limbic cortex and fornix,
- Functions including:
 - Emotion
 - anger, fear, anxiety, etc.
 - Behavior
 - Long term memory, and
 - Olfaction.

The Limbic System



Neural Regulation

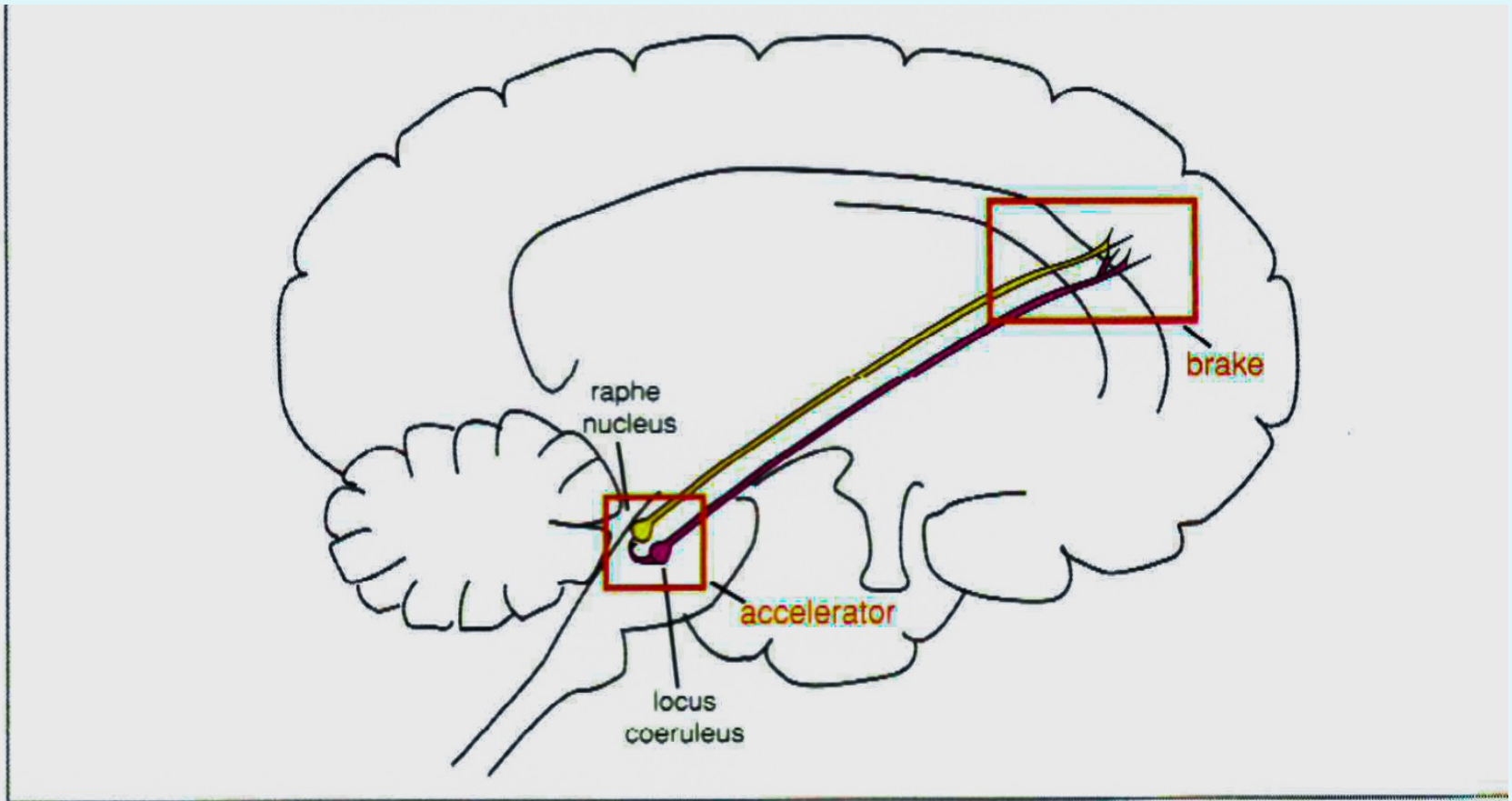
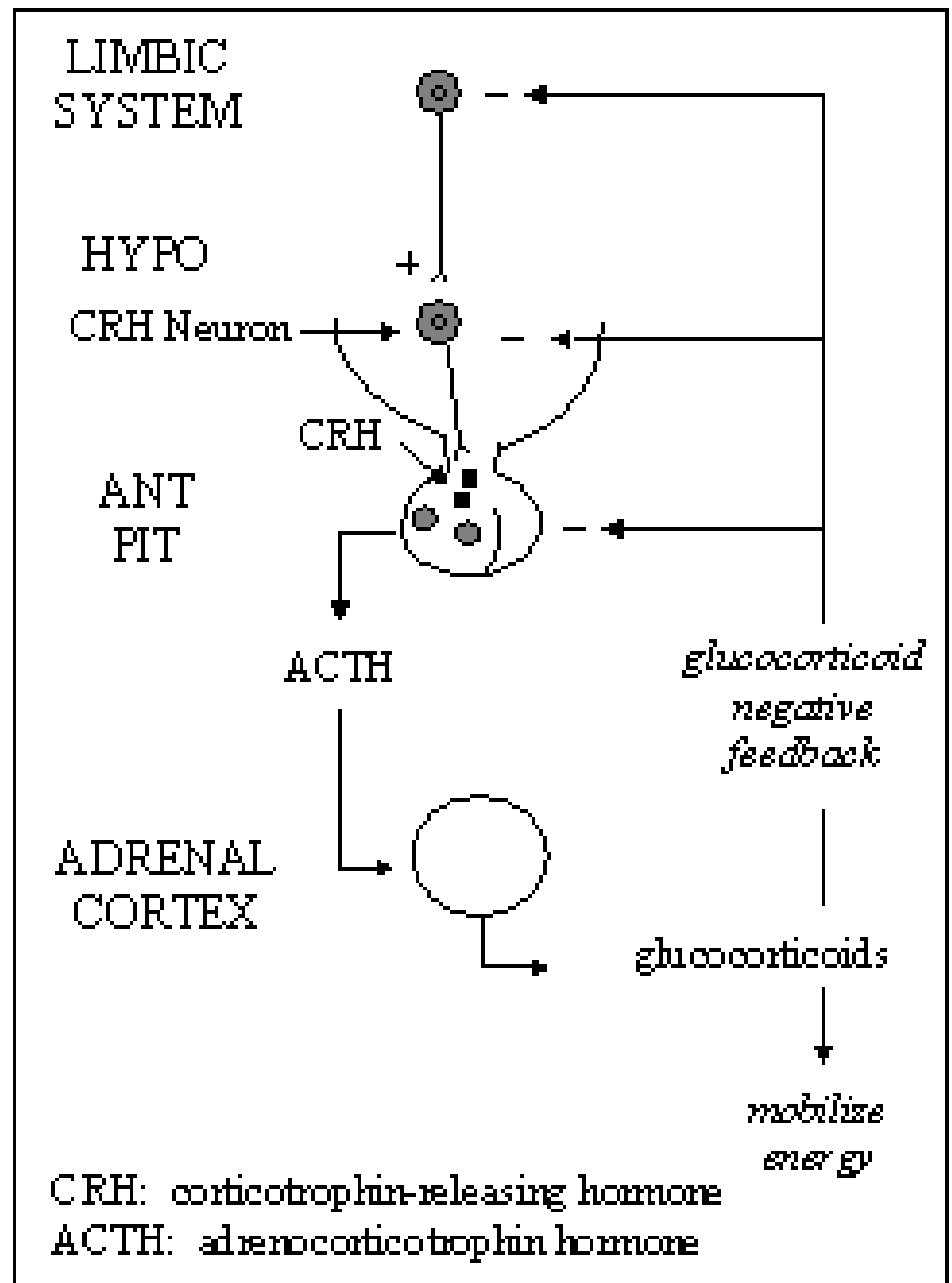


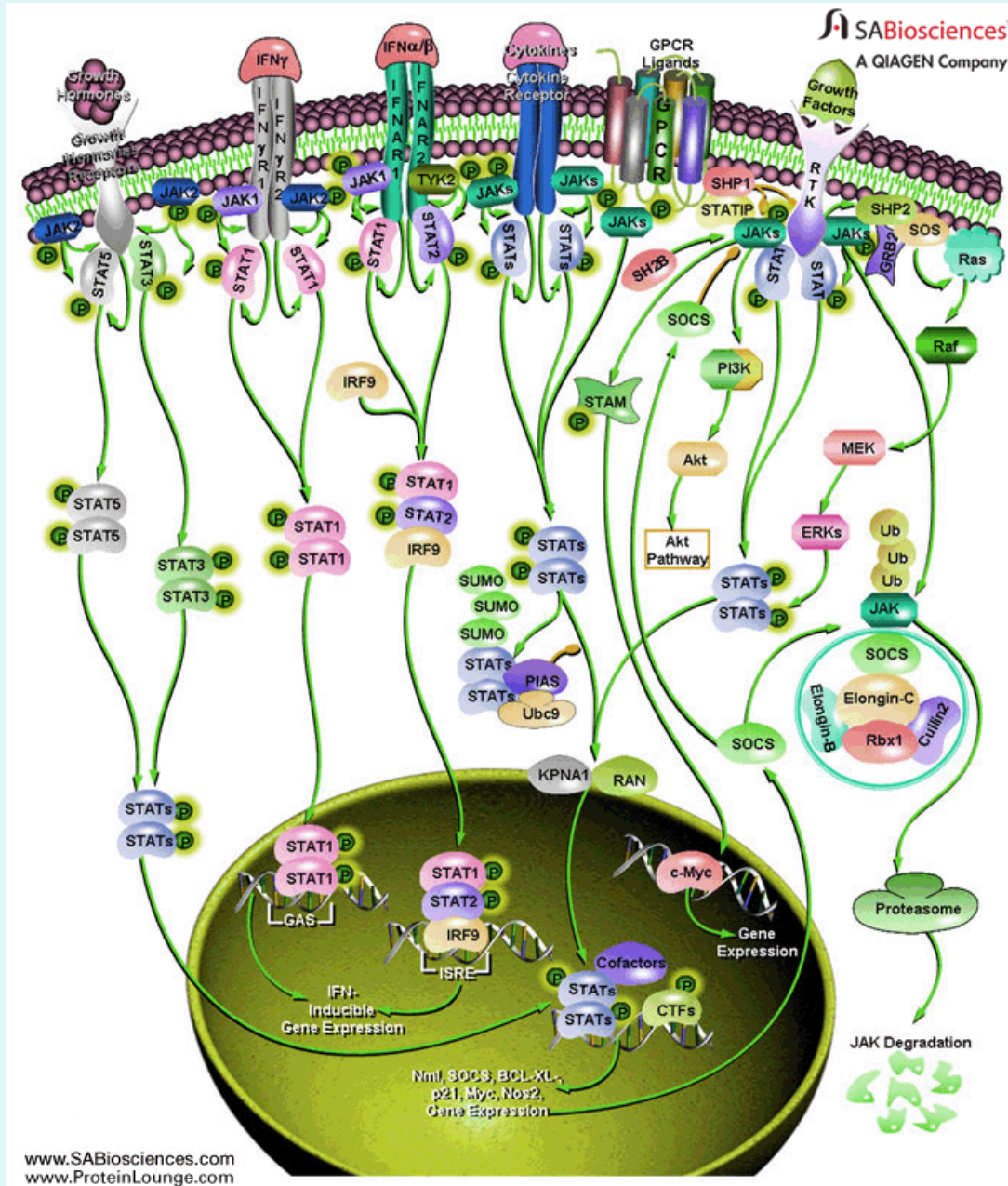
FIGURE 11-35 Norepinephrine regulation of serotonin. Norepinephrine regulates serotonin release. It does this by acting as a brake on serotonin release at alpha 2 receptors on axon terminals and as an accelerator of serotonin release at alpha 1 receptors at the somatodendritic area.

HPA Axis

Hypothalamo-Pituitary-Adrenocortical Axis (HPA axis):

- stress is perceived by limbic system
- neurons in the limbic system activate the HPA axis
 - CRH neurons in hypothalamus release CRH at median eminence
 - CRH stimulates release of ACTH from cells in the anterior pituitary
 - ACTH stimulates both synthesis and release of glucocorticoids from adrenal cortex
 - glucocorticoids act, in part, to mobilize energy for the *fight or flight response*
 - glucocorticoids also act to restrain the HPA axis by inhibiting hormone release at the level of the hypothalamus, pituitary, and higher brain regions (limbic system)

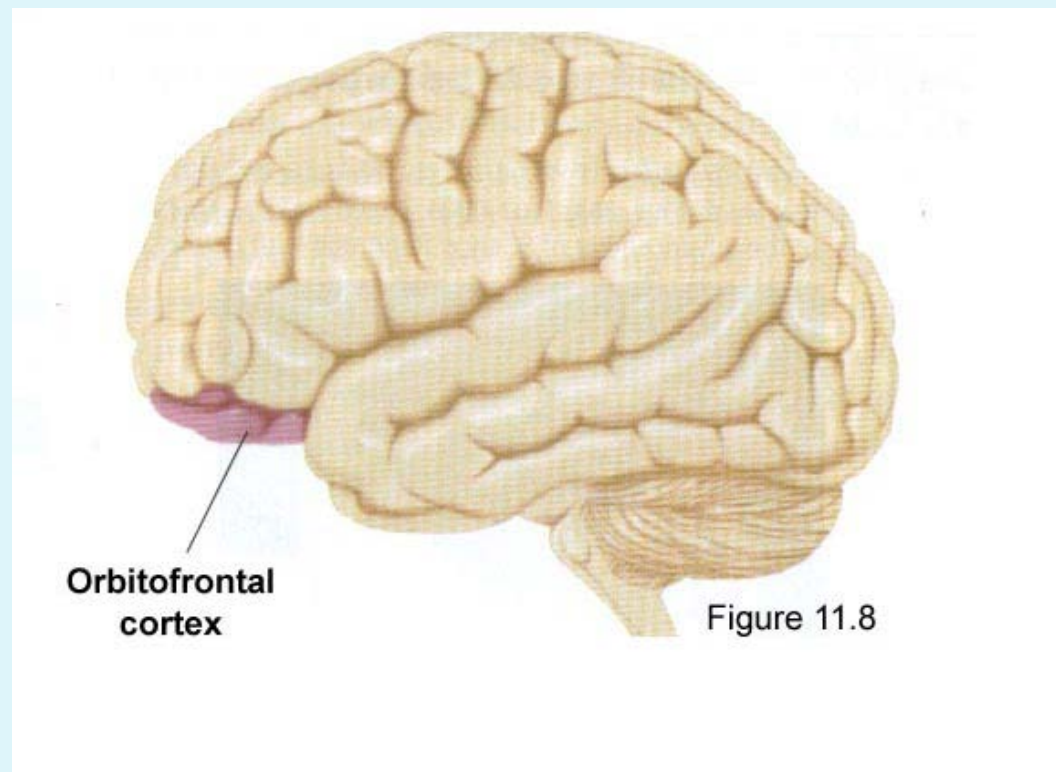




Signaling pathways mediating the transduction of information between cells are essential for development, cellular differentiation and **homeostasis**.

Their **dysregulation** is also frequently associated with human malignancies.

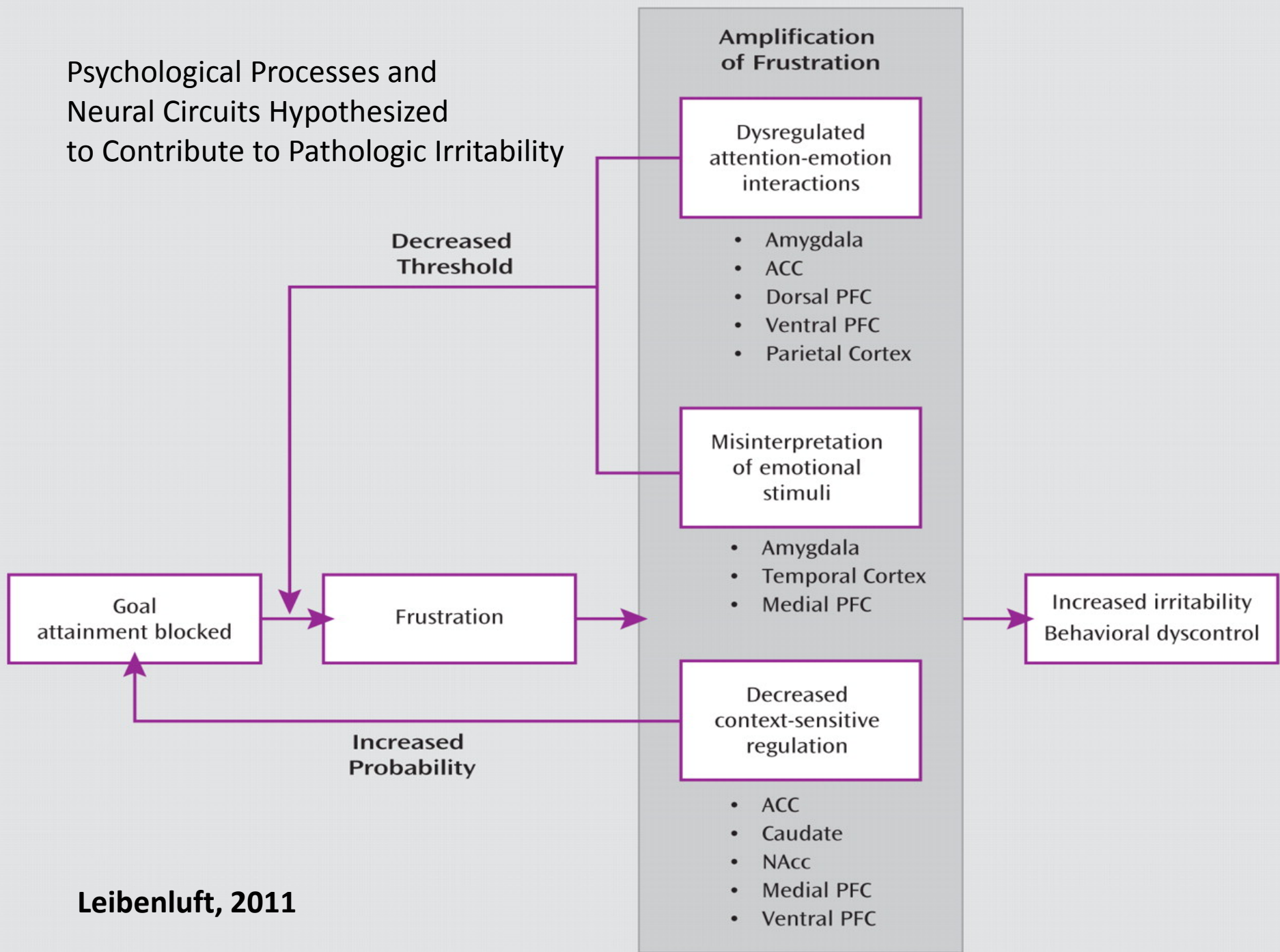
In neuroimaging studies of anger, the most consistently activated region of the brain was the lateral orbitofrontal cortex.



International Handbook of Anger.
Chapt 4: Constructing a Neurology of Anger.
Michael Potegal and Gerhard Stemmler. 2010

<http://bungelab.berkeley.edu/kidscorner/kidscorner/glossary.html>

Psychological Processes and Neural Circuits Hypothesized to Contribute to Pathologic Irritability



Leibenluft, 2011

Both the popular and the scientific literature describe "RAGE BEHAVIOR" as

- Impulsive and explosive,
- Occurring in discrete episodes
- Showing a highly emotional, agitated state with little thinking and no planning.

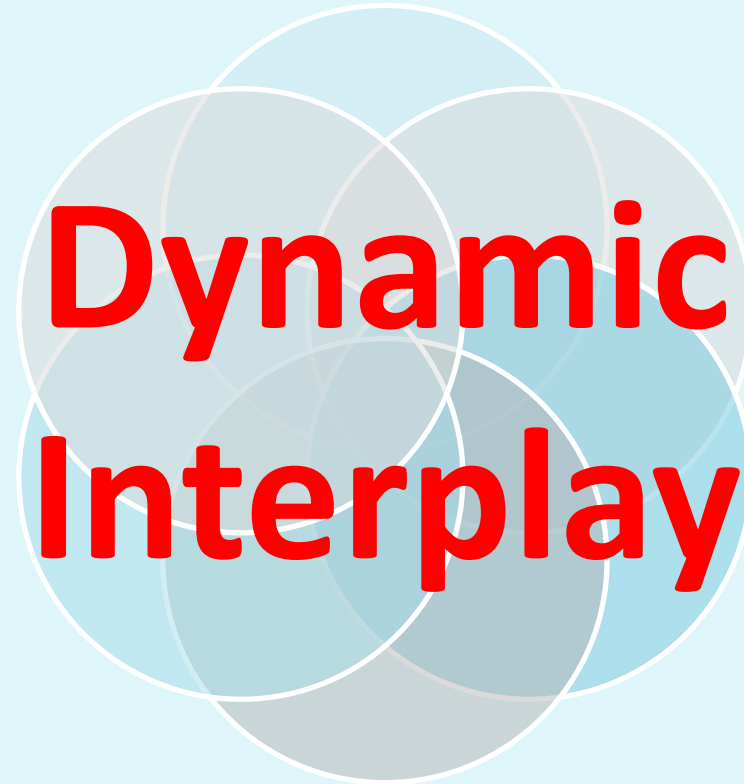
Genetics
(Mutable)

Environment
Experiences
Illnesses

Individual's
Development
"Learning"

Social
Interactions

Spirituality



Psychological Factors

RAGE - Psychological

- Primitive emotion conceptualized as a preverbal, precognition psychological defense mechanism stemming from **perceived failure of need fulfillment**
- Rage is construed as an attempt to summon help by an infant who experiences terror and whose very **survival feels under threat.**

Parker Hall, 2008, *Anger, Rage and Relationship: An Empathic Approach to Anger Management*, Routledge

The American psychologist **Albert Ellis** has suggested that anger, rage, and fury partly have roots in the philosophical meanings and assumptions through which human beings interpret **transgression**.

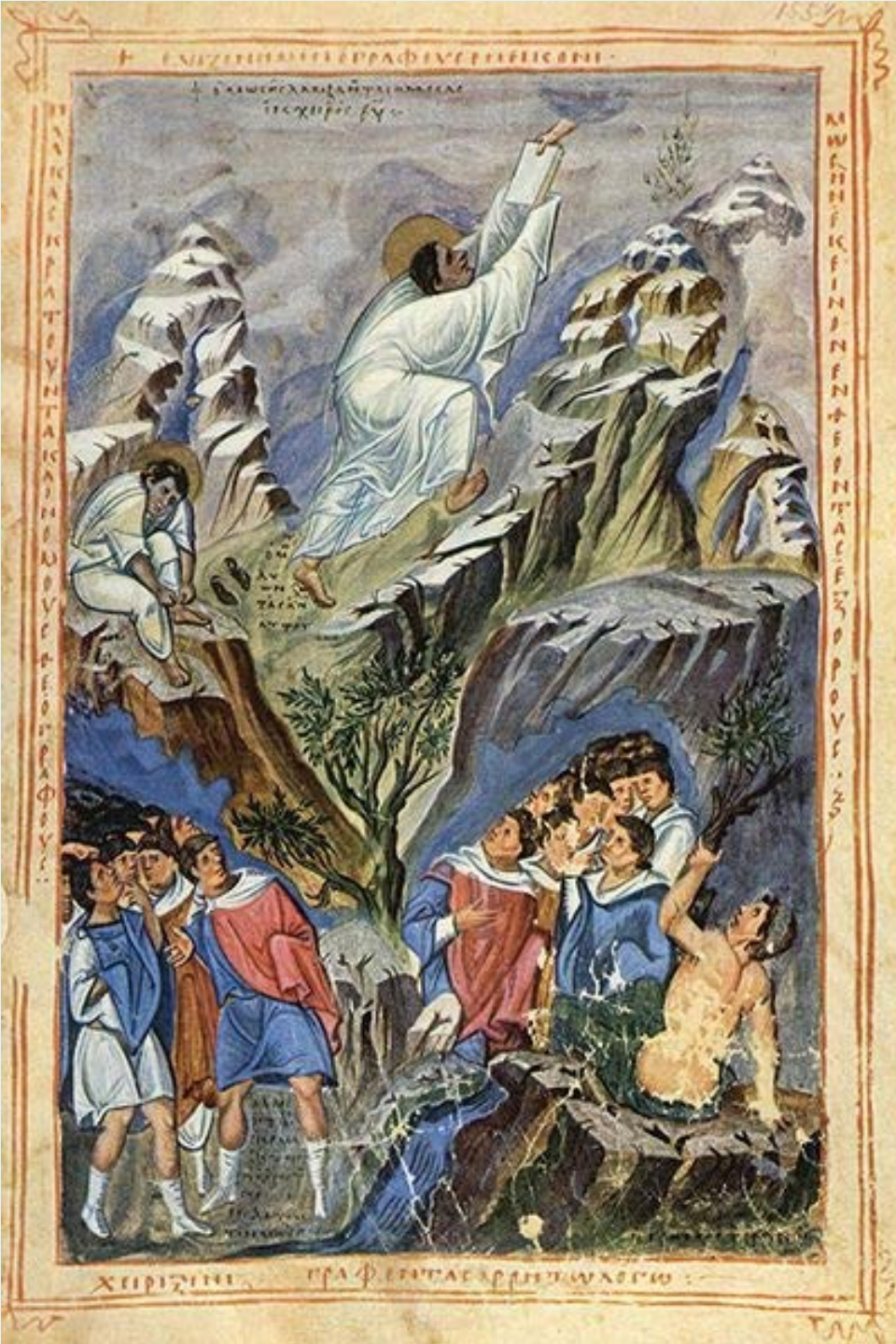


Ellis, Albert (2001). *Overcoming Destructive Beliefs, Feelings, and Behaviors: New Directions for Rational Emotive Behavior Therapy*. Prometheus Books.

Expulsion from Paradise; marble bas-relief by Lorenzo Maitani on the left pier of the façade of the cathedral; Orvieto, Italy



Genesis 3:22-24



Artist Meister der Bibel des Patrice Léon

Title **Deutsch:** Bibel des Patrice Léon, Szene:
Moses empfängt die Gesetzestafeln auf dem
Berge Sinaii, BAV Reg. gr. 1, Fol. 155v

Deuteronomy 9

[18] And I fell down before the LORD, as at the first, forty days and forty nights: I did neither eat bread, nor drink water, because of all your sins which ye sinned, in doing wickedly in the sight of the LORD, to provoke him to **anger**.

[19] For I was afraid of the **anger** and hot displeasure, wherewith the LORD was wroth against you to destroy you. But the LORD hearkened unto me at that time also.

Expulsion of the Money-changers from the Temple

Christians believe in God's anger in the sight of evil. This anger is not inconsistent with God's love, as demonstrated in the Gospel where **the righteous indignation of Christ** is shown when he drives the moneychangers from the temple.

Christians believe that those who reject His revealed Word, Jesus, condemn themselves, and are not condemned by the wrath of God.^[71]

Mathews & Smith



Giotto di Bondone (1267-1337), Cappella Scrovegni a Padova, Life of Christ, Expulsion of the Money-changers from the Temple

Genetics

- Gene variations produce vulnerabilities for various conditions including **anxiety, irritability, inflammation**, etc.
- Genes affect neurotransmitter and receptor functions, etc.
- Most psychiatric disorders are highly heritable



- Normal Development Adjustments
 - Preschoolers and Adolescents
- Nutritional Deprivation / Inadequacy
- Psychosocial Circumstances / Interactions
- Relationships / **Attachment**
- Traumatic Experiences
- Sleep Deprivation
- Medical Conditions,
- Inflammation, Allergic Conditions
- Psychiatric Conditions
- Substance Use / Abuse
- Medications
- Toxins

Causes of Irritability



Cytokines (IL-1 and IL-2) have potent effects in modulating defensive rage behavior.

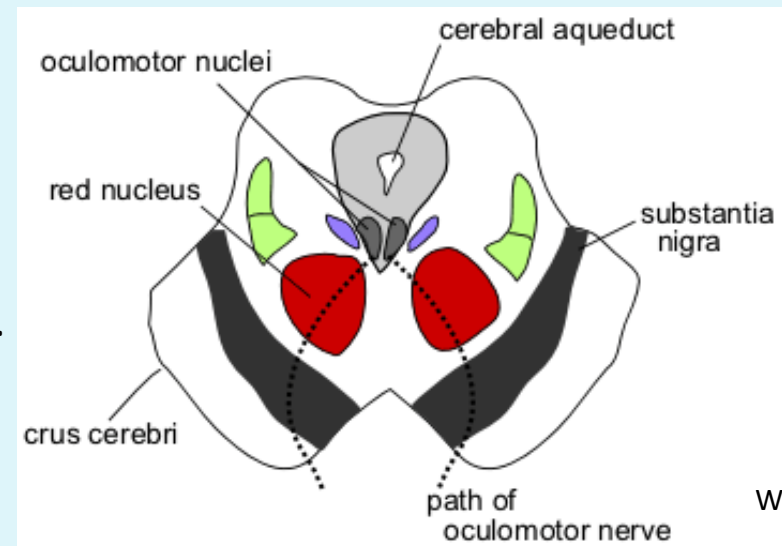
- **IL-1 facilitates defensive rage** when microinjected into either the medial hypothalamus or PAG and these potentiating effects are mediated through 5-HT₂ receptors.
- **IL-2 microinjected into the medial hypothalamus suppresses defensive rage** and this suppression is mediated through GABA(A) receptors, while microinjections of IL-2 in the PAG potentiate defensive rage, in which these effects are mediated through NK-1 receptors.

The neurobiology of aggression and rage:
role of cytokines.

Brain Behav Immun. 2006 Nov;20(6):507-14.

Epub 2006 Aug 30.

Zalcman SS, Siegel A.



Children with Behavioral Problems More at Risk of Inflammation, Potentially Worsening Health Later in Life

- **4,000 Children with behavioral problems** at age 8 had higher levels of two proteins (**C-reactive protein—CRP**; and **Interleukin 6—IL-6**) in their blood when tested at age 10, even after a large number of other factors, including sex, race, background, and medication use, were taken into account.
- Having raised levels of CRP and IL-6 can be an early warning sign that a person may be **at risk of chronic or inflammatory conditions later in life**, including heart disease, obesity, diabetes, as well as inflammatory illnesses (conditions which are caused by cell damage).

September 4, 2013; Karestan Koenen, PhD; Psychoneuroendocrinology.

Cytokines & Behavior Problems (Continued)

- The link may be due to the fact that many behavioral problems are associated with how the hypothalamic pituitary adrenal (HPA) axis works. The HPA axis plays a major role in controlling reactions to stress and the immune system and, if it malfunctions, it can stimulate the release of the two proteins that cause chronically elevated levels of inflammation, which is tissue's response to injury.



“Mood swings are analogous to a **fever in pediatrics—they indicate something potentially is wrong with the patient, but are not diagnostic as an isolated symptom.”**

Robert A. Kowatch, MD, PhD

*Professor of Psychiatry and Pediatrics,
Cincinnati Children’s Hospital Medical Center, Cincinnati, OH*