

## Part 3 The Anti-Reward System of the Adolescent Brain and Genetics

Dr. Merrill Norton Pharm.D.,D.Ph.,ICCDP-D  
Clinical Associate Professor  
University of Georgia College of Pharmacy  
Athens, Georgia  
mernort@gmail.com

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## The Genetics of Addiction: What Is Your Profile?

Dr. Merrill Norton Pharm.D., D.Ph.,ICCDP-D  
University of Georgia College of Pharmacy  
mernort@uga.edu

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### Dependence: An Affective Definition

“The notion of dependence on a drug, object, role, activity or any other stimulus-source requires the crucial feature of negative affect experienced in its absence. The degree of dependence can be equated with the amount of this negative affect, which may range from mild discomfort to extreme distress, or it may be equated with the amount of difficulty or effort required to do without the drug, object, etc.”

From: Russell MAH. What is dependence? In Edwards G (ed), *Drugs and Drug Dependence*, Lexington Books, Lexington, MA, 1976, pp. 182-187. 3

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## Types of Genetic Alcoholism

- Type O Environmental Alcoholism
- Type I Adult Onset Alcoholism
- Type II Juvenile Onset Alcoholism
- ??? Type III Female Onset Alcoholism

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## “The Necessary Nine”

- Norepinephrine/Epinephrine-**stimulant, anger, fear, anxiety, fight, flight**
- Serotonin-**depressant, sleep, calm, pleasure**
- GABA-**relaxant, stress reduction, seizure threshold**
- Endorphins-**pain relief, pleasure**
- Acetylcholine-**involuntary actions, memory, motivation**
- Anandamide-**memory, new learning, calmness**
- Glutamate-**organization of brain signaling, memory, pain**
- Dopamine-**perception, movement, pleasure**
- PIP- **loving of one’s self, others, GOD**

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Neurotransmitters of Addiction/Trauma

Addiction/Trauma	PIP Dopamine Glutamate Acetylcholine Anandamide Endorphins / Enkephalins GABA Serotonin Epinephrine / Norepinephrine	Recovery
		
Depletion may take less than 12 months		Replenishment may take 5 to 7 years

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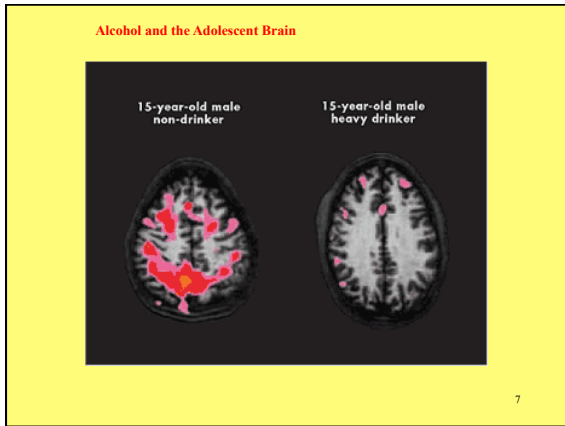
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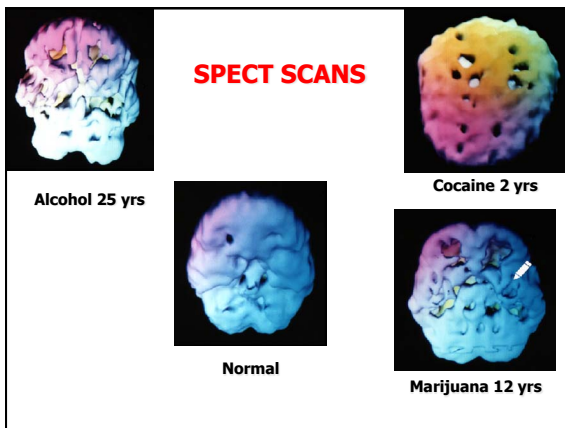
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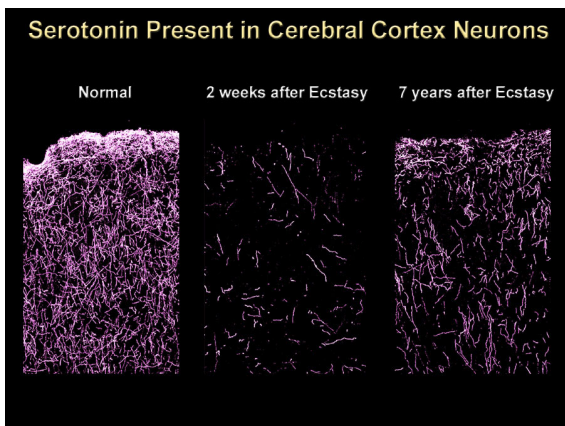
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## Brain Development/ Aging

- Recent research (imaging studies) have given scientists an estimate of brain chemistry development:
- Age 5 - 35% complete
- Age 11 - 50% complete (pre-puberty)
- Age 18 - 75% complete (post puberty)
- Age 24-35 - 100% complete
- Age 44 - 75%
- Age 60 - 50%
- Age 75 - 35%

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### Aging and the Brain

11 years old-50%	18 years old-75%	22-32 years old-100%
44 years old-75%	60 years old-50%	75 years old-35%

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WITHSTANDING ( Neurochemistry for Grief/Loss)
EMERGENCY (Neurochemistry for Flight/Fight)
NORMAL (Neurochemistry to function)

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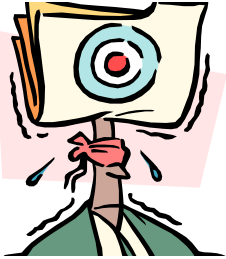
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### Type 0- Environmental Alcoholism

- Male or Female
- Negative Family History
- Drinking Begins age 18-22
- Performance improves after drinking pattern
- Maybe genetic beginnings



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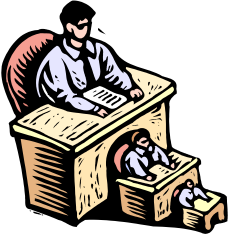
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### Type 0-Environmental Alcoholism

Age 18 (Normal)



WITHSTANDING
75%
75%
EMERGENCY
75%
75%
NORMAL
75%
75%

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### Type 0-Environmental Alcoholism

Age 18 Binge Drinking



WITHSTANDING
75%
↑75%
EMERGENCY
75%
↑75%
NORMAL
75%
↑75%

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### Type I Adult Onset Alcoholism

- Male or Female
- 1<sup>st</sup> Drink age 16-18
- Positive Family History
- Passed from mother/ father to son/ daughter
- 12-15 years drinking before treatment
- 70% AA



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### Type I Alcoholism



Age 18 Normal  
Age 18 Genetic

WITHSTANDING	65%	75%
EMERGENCY	65%	75%
NORMAL	65%	75%

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### Type I Alcoholism



Age 30 Normal  
Age 30 Binge Drinking

WITHSTANDING	65%	100%
EMERGENCY	65%	100%
NORMAL	65%	100%

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## Type II Juvenile Onset Alcoholism

- Male Only
- 1<sup>st</sup> drink age 10-12
- Positive History, Father-Son
- Skips generations
- Rapid onset, less than 2 years
- High Risk Behaviors
- 70% Male Prisoners



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## Type II Alcoholism

Age 11 Normal  
Age 11 Genetic



WITHSTANDING 10% 50%
EMERGENCY 10% 50%
NORMAL 25% 50%

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## Type II Alcoholism

Age 11 Normal  
Age 11 Genetic



WITHSTANDING ↑10% → 100% 50%
EMERGENCY ↑10% → 100% 50%
NORMAL ↑25% → 100% 50%

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### ???Type III Female Onset



- Unable to research
- Mother-Daughter
- Depression
- Premenstrual Syndromes
- Low Pain Tolerance
- Anxiety, Panic Disorder

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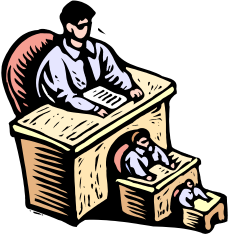
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### Female Type III Alcoholism



Age 11

WITHSTANDING
20%
50%
EMERGENCY
20%
50%
NORMAL
35%
50%

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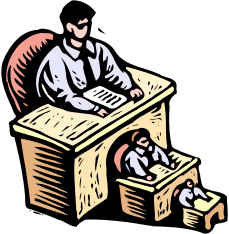
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### Female Type III Alcoholism



Age 11 (Normal)  
Age 11(Genetic)

WITHSTANDING
↑20% → 100%
50%
EMERGENCY
↑20% → 100%
50%
NORMAL
↑35% → 100%
50%

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### What Is Your Profile?

- Age of First Drink \_\_\_\_\_
- Age of First Drug \_\_\_\_\_
- Family History of Addiction \_\_\_\_\_
- Family History of Mental Illness \_\_\_\_\_
- Family History of Trauma \_\_\_\_\_
- Family History of Suicide \_\_\_\_\_
- Are you compulsive/impulsive? \_\_\_\_\_
- Are you perfectionistic? \_\_\_\_\_
- Do you have healthy communications  
with your family members? \_\_\_\_\_
- Are you a religious person or been  
involved in spiritual programming in your life?  
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### *Not All Addictions Are Created Equal*



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