The New Neurobiology of Addiction

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Newark, New Jersey
Monday, December 9, 2019
Outline

1. The Basic Model
2. Neurobiology of Addiction
3. New Neurobiological Concepts
4. Addiction Treatments
5. New Directions
1
The Basic Model
A Biopsychosocial Illness

Biological
Psychological
Social

Brain
Switch

Addiction

Use

Neurobiology of Addiction
Natural Rewards

Adapted from: Di Chiara et al, *Neuroscience*, 1999
Effects of Drugs on Dopamine Levels

Adapted from: Di Chiara and Imperato, Proceedings of the National Academy of Sciences USA, 1988; courtesy of Nora D Volkow, MD
Effects of Amphetamines on Dopamine Levels

Adapted from: Di Chiara and Imperato, Proceedings of the National Academy of Sciences USA, 1988; courtesy of Nora D Volkow, MD.
Pleasure-Reward Pathways
New Neurobiological Concepts
Three Novel Areas

✔ Motivational Circuitry
✔ Antireward Pathways
✔ Interoception

Motivation: The Stinking Thinking Part

IF I EAT THE WHOLE BOX NOW, THEN I WON'T BE TEMPTED LATER!
Reward and Antireward Systems

sensual touch

thirst

INTEROCEPTION

PAIN

itch

temperature

hunger

breathlessness
4
Addiction Treatments
The Current Approach

✔ Medications
✔ Motivational Interviewing
✔ Mutual Help (12-step)

5

New Directions
“Between stimulus and response there is a space. In that space is our power to choose our response. In our response lie our growth and our freedom.”

Viktor E. Frankl

Thank you

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