Risky Business: Helping Adolescents Manage Risk Taking Behaviors

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New Research on the Adolescent Brain

- Discoveries from Neuroimaging
  - fMRI
  - Diffusion Spectrum Imaging
  - SQUID Magnetometry
  - MEG Magnetoencephalography
Who is at Risk?

- Genetics
- Environment
- Experiences
• Codeine converted to Morphine
  • Metabolic function
• Poor
• Effective
• Moderate
• Ultra fast
A Disease of the Brain
Who is at Risk?

- Genetics
- Environment
- Exposure
Brain Facts

- 200 Billion Cells
- Gray Matter/White Matter
Brain Facts

- Jumping Genes

- Migration and Activation
Adolescent Hormones

- Testosterone
  - Primary and Secondary Sex Characteristics

- Estrogen
  - Primary and Secondary Sex Characteristics
Gender Connectome Project

- University of Pennsylvania
  - Raquel and Reuben Gur
  - DTI
- 949 subjects  521 Females, 428 Males  8-22 years of age
  - Male Brain
  - Female Brain
Why is this Brain at Risk?

- Emotional Intensity
  - 2 to 4 Times
  - More Frequent Change
  - Male/Female
- Legitimate/Normal
Why is this Brain at Risk?

• Emotional Intensity
  • Mirror, Mirror
  • A/A sites

• Risk/Reward in Change of Appearance

• Male/Female Brain Differences
Why is this Brain at Risk?

Depression

Serotonin Synthesis
Why is this Brain at Risk?

- Problem Solving
  - No Load

Social/Emotional Crisis

The Crisis Chemical THP

- Emotional Support Essential
Teens and Conflict

- Migration and Activation
  - Cell Migration
    - L1
  - Benchmarks
    - “I Know!”
    - Open Conflict
- Don’t take it personally
Teen Brains and Decisions

- Love to Hate
  - Validate emotions
  - Limit judgement

- That’s What I Want
  What is the “reason”? 
  If not now, then when
  If not that, then what
Motivation for Drug Use

• Seek drugs for:
  • Create positive effect in brain chemistry
    • Dopamine release in reward sites
  • Suppress negative emotions
    • Activation in specific sites
Gender Differences
Most Popular Drugs

- Alcohol, Nicotine and Marijuana
- Pain Pills/Fentanyl
- Heroin
- Often combined use
  - Different risk factors when combined
New Cohort

Which women and girls are most likely to binge drink?

- Women aged 18-34 and high school girls
- Whites & Hispanics
- Women with household incomes above $75,000

Binge drinking* among women and high school girls by age group

- High School: 20%
- Ages 18-24: 24%
- Ages 25-34: 20%
- Ages 35-44: 15%
- Ages 45-64: 10%
- Ages ≥65: 3%

Binge drinking* by race/ethnicity among women and high school girls

- Hispanic: 22%
- White, non-Hispanic: 17%
- Other non-Hispanic†: 17%
- Black, non-Hispanic: 10%

*Ties other non-Hispanic includes Asian, Native Hawaiian/other Pacific Islander, American Indian/Alaskan Native, and multiracial.

Binge drinking* among high school students reporting current alcohol use* by grade

- Grade 9: 45%
- Grade 10: 50%
- Grade 11: 58%
- Grade 12: 62%

*Reported behavior in the past 30 days.
Brain Facts

- Risk Taking
  - New Sites of Activity
  - Influence of Peers
  - Male/Female

- Emotional Reward
I Second That Emotion

• Social Bonding and Connecting

• You got to have friends.

• Like and Admire
Cultural and Environmental Influences

- Role Models
- TV
- Social Media
Risk Taking

• Kylie Jenner Challenge
Risk Taking

The Choking Game
And Some of the Lives It’s Taken
High Risk Apps

- Omegle
Risky Business
Household Products

- Solvents
  - Brain Damage
  - Sudden Fatal Event
Alcohol: New Products

- Alcohol treats
- Pocket Shots
Long Term Outcomes of Underage Drinking

- 10% Loss of Volume in Prefrontal Cortex
  - Executive Function
  - Learning
  - Reasoning

Image from McQueeny et al., Alcohol Clin Exp Res, 2009
Long Term Outcomes

• 10% Loss of Volume in Hippocampus
  • Memory
  • Motivation
  • Social Behaviors

Image by Dr. Susan Tapet, UCA
Alcohol: the Costs

• 13 teens die each day in the US
• 600,000 HS and college students injured per year
• 70,000 alcohol-involved sexual assaults per year
• Drop outs/Flunk outs
• Unwanted pregnancies
• Addiction potential
Impulse Control

- PRDM2
  - Down regulated
  - Disrupts impulse control
New Products

• Marijuana edibles
New Products: Dabbing

• Butane Hash Oil

• Amber, Shatter, Ear Wax
The Healthy Alternative
Devices
Alcohol and Drug Combinations

- Robo-shots/Mucys
  - Dextromethorphan
  - Opioid cough suppressant
  - Plus alcohol
  - Rapid and powerful intoxication
  - Motor control
  - Impulse control
  - Delusional
Medicine Cabinet

• Rx and OTC
  • Parents and Grandparents
  • Siblings
Heroin: Pharmacology

- Source
On the Street

- Price
- As low as $12
Routes of Administration

- Snorting
- Smoking
- Injecting: IV, SC, IM
Route of Administration
Risk Factors

- Addiction
- Infection
- Overdose
Heroin and other drugs

Heroin use is part of a larger substance abuse problem.

Nearly all people who used heroin also used at least 1 other drug.

Most used at least 3 other drugs.

Heroin is a highly addictive opioid drug with a high risk of overdose and death for users.

People who are addicted to...

- Alcohol: 2x
- Marijuana: 3x
- Cocaine: 15x
- Rx Opioid Painkillers: 40x

...more likely to be addicted to heroin.

Opioid effects

• NOT better than other options

• Pain complex; physical, emotional, social, vocational

• Sleep

  • Only opioids: Decrease Pain, Reduce Anxiety, Induce Sleep, and Create Euphoria
By the Numbers

Drug Overdose fatalities in the US
152 per day       55,400 per year

Alcohol fatalities in the US.
241 per day       88,000 per year
Prom Night

• The Best of Times/The Worst of Times

• Social event

• The Bad News

• 300+ 63% no seat belt
High Risk

• Driving

• Swimming

• Falls

• Burns
The Cabin in the Woods

- Highest Risk for Females
  - Second Location
    - More bad outcomes
A Day at the Beach

- Spring, Summer, and Fall
- Open water drownings
- Male / Female
Healthy Options

• Evaluate Risk Spectrum

• Introduce Activities

• Role Model

• Create Opportunities
Boundaries

Healthy Boundaries

Examples of "un-healthy" Boundaries

Limited non-existent

Loose or porous

RIGID "a wall"
Boundaries

Negotiable
- Curfew
- Sleepovers
- Concerts
- Peer Drivers

Non-Negotiable
- Drug and Alcohol Use
- Parental Contact
- Transportation
- Impaired Drivers
Effective Language for Risk Assessment

- Immediate
- Social/Emotional
  - Physical Appearance
- Impact on Others
Consequences

• Immediate
• Proportional
• Short term
• No Add Ons
Effective Language

- The “If - then” construct
  - Signifies accountability, not power
  - Has remindability built in
  - Not what we want, but what is necessary
Why is this Brain at Risk?

A Work in Progress

• Stages of Adolescent Development

Emerging Adult Brain

• The Long and Winding Road
Wrap Up

• Validate Emotions

• Social Bonding

• Risk-Taking Opportunities

• Crisis Support

• Early Intervention