FACTORS ASSOCIATED with TOBACCO USE & MENTAL ILLNESS

WHY do INDIVIDUALS with MENTAL ILLNESS SMOKE?

Smoking in adolescence is associated with psychiatric disorders in adulthood, including: panic disorder, GAD and agoraphobia, depression and suicidal behavior, substance use disorders, and schizophrenia (Breslau et al., 2004; Weiser et al., 2004; Goodman, 2000; Johnson et al., 2000)

SMOKING

MENTAL ILLNESS

Active psychiatric disorders are associated with daily smoking and progression to nicotine dependence (Breslau et al., 2004).

FACTORS ASSOCIATED with TOBACCO USE in the MENTALLY ILL

Psychological/Behavioral

Conditioning effects

Coping tool

Social interactions

Boredom

Biologic & Pharmacologic

Genetic predisposition

Aversion of withdrawal

Pleasure effects

Weight control

Systemic & Treatment

Use of cigarettes for reinforcement

Failure to treat

NEUROCHEMICAL and RELATED EFFECTS of NICOTINE

- Dopamine ➔ Pleasure, reward
- Norepinephrine ➔ Arousal, appetite suppression
- Acetylcholine ➔ Arousal, cognitive enhancement
- Glutamate ➔ Learning, memory enhancement
- β-Endorphin ➔ Reduction of anxiety and tension
- GABA ➔ Reduction of anxiety and tension
- Serotonin ➔ Mood modulation, appetite suppr.

Nicotine enters brain

Stimulation of nicotine receptors

DOPAMINE REWARD PATHWAY

Prefrontal cortex

Nucleus accumbens

Ventral tegmental area

Dopamine release


BIOLOGY of NICOTINE ADDICTION: ROLE of DOPAMINE

Nicotine addiction is not just a bad habit.

Discontinuation leads to withdrawal symptoms.

Nicotine stimulates dopamine release

Repeat administration

Tolerance develops

CHRONIC ADMINISTRATION of NICOTINE: EFFECTS on the BRAIN

Human smokers have increased nicotine receptors in the prefrontal cortex.

Nonsmoker
Smoker

Image courtesy of George Washington University / Dr. David C. Perry


State of Nicotine Withdrawal

nicotine receptor


NICOTINE ADDICTION CYCLE

Nicotine
Nicotine-1'N-oxide
Norenicotine
Norcotinine
Cotinine
Cotinine-1N-oxide
Trans-3'-hydroxycotinine glucuronide

Most symptoms peak 24–48 hr after quitting and subside within 2–4 weeks.

Refer to Withdrawal Symptoms Info Sheet

NICOTINE WITHDRAWAL EFFECTS

- Dysphoric or depressed mood
- Insomnia and fatigue
- Irritability/frustration/anger
- Anxiety or nervousness
- Difficulty concentrating
- Impaired task performance
- Increased appetite/weight gain
- Restlessness and impatience
- Cravings*

* Not considered a withdrawal symptom by DSM-IV criteria.

American Psychiatric Association (1994). DSM-IV.
Hughes et al. (1991). Arch Gen Psychiatry 48:52–58
Hughes & Hatsukami (1998). Tob Control 7:52-83

GENETIC EFFECTS on NICOTINE METABOLISM

Reprinted with permission, Benowitz et al., 1994.
WHAT is ADDICTION?

“Compulsive drug use, without medical purpose, in the face of negative consequences”

Alan I. Leshner, Ph.D.
Former Director, National Institute on Drug Abuse
National Institutes of Health

MODEL of ADDICTION

Impulse control disorders
- Impulse acts
- Positive Reinforcement
- Negative Reinforcement

Compulsive disorders
- Obsessions
- Anxiety / stress
- Regret / guilt / self-reproach
- Tension / arousal

TIME

Source: GF Koob et al. (2004) Neuroscience and Biobehavioral Reviews

DSM-IV TOBACCO USE DISORDERS

Nicotine Dependence
- Maladaptive pattern of use with significant impairment manifested by 3+ in 12-mos:
  1. Tolerance
  2. Physical withdrawal
  3. Use
  4. Time investment
  5. Unsuitable efforts to stop
  6. Loss of important activities
  7. Continued use despite knowledge of physical or psychological problems

Nicotine Withdrawal
- Daily use of nicotine
- Abrupt cessation/reduction followed within 24 hrs by 4+:
  1. Depressed mood
  2. Insomnia
  3. Irritability
  4. Anxiety
  5. Difficulty concentrating
  6. Decreased HR
  7. Increased appetite

SYSTEMIC and TREATMENT FACTORS

Pub. 1951

PSYCHIATRISTS in PRACTICE

(Himmelhoch & Daumit, 2003)

- 1992-96 Nat'l Ambulatory Medical Care Survey
- 23% of psychiatric visits dropped from analysis because patient smoking status unknown
- For patients identified as smokers (N=1610)
  - Cessation counseling offered at 12% of visits
  - Nicotine Dependence not diagnosed at any visit
  - Nicotine replacement therapy never prescribed

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2005 AAMC PRACTICE SURVEY: 
801 PSYCHIATRISTS

- 62% Ask about tobacco
- 44% Assess readiness to quit
- 62% Advise cessation
- Assist:
  - NRT (23%), other Rx (20%)
  - Cessation materials (13%)
- 14% Arrange follow up
- 11% Refer to others

Psychiatrists the least likely to address tobacco use with their patients relative to other specialties (family medicine, internal medicine, OB/GYN)

2008 American Psychiatric Nurses Association Survey

- 85% Ask about tobacco
- 61% Refer patients for tobacco cessation
- Only 29% of respondents’ agencies offer tobacco cessation treatment

PSYCHIATRY RESIDENTS’ (N=105) ENGAGEMENT in the 5-As

<table>
<thead>
<tr>
<th></th>
<th>Never or Rarely</th>
<th>Sometimes</th>
<th>Often or Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ask about smoking</td>
<td>80%</td>
<td>16%</td>
<td>4%</td>
</tr>
<tr>
<td>Advise to quit</td>
<td>52%</td>
<td>49%</td>
<td>9%</td>
</tr>
<tr>
<td>Assess readiness to quit</td>
<td>62%</td>
<td>35%</td>
<td>13%</td>
</tr>
<tr>
<td>Assist with quitting</td>
<td>72%</td>
<td>18%</td>
<td>10%</td>
</tr>
<tr>
<td>Arrange follow-up</td>
<td>72%</td>
<td>18%</td>
<td>10%</td>
</tr>
</tbody>
</table>

Source: Prochaska, Fromont et al., 2005 Acad Psychiatry

Legacy Tobacco Documents

- Digital online library
- 10+ million documents (50+ million pages) from the major tobacco companies
- Related to their advertising, manufacturing, marketing, sales, and scientific research activities

http://legacy.library.ucsf.edu

TOBACCO INDUSTRY’S INTERESTS

- 1950s-1980s: Beliefs that patients with schizophrenia, who smoke at high rates, immune to cancer
TOBACCO INDUSTRY’S INTERESTS

- 1960s–1970s: TI funded research on psychosomatic causes of cancer
  - Proposed those who denied or repressed grief were more likely to develop cancer than those who expressed emotion
  - "longterm schizophrenics, outwardly calm, have no capacity for the repression of significant emotional events and no need to contain emotional conflict."
  - Ultimately came under scrutiny for its "scientific integrity"

Finally, Kissin produced a paper in April 1979 in which he interpreted his own statistically significant results as supporting this hypothesis. He concluded that his statistical work in the past had been meant. He had tried to get him to see a good statistical consultant but failed in this.

We position therefore was not satisfactory. There was no particular a priori basis that, if Kissin’s repressions about long cancer patients’ emotions was right and wrong had also made the case critical primary to us - the whole foundation of Kissin’s work might be revoked away at any time. My evidence, which he himself will be capable of this particular point.

But might we not sometimes have been a cunning and giving publicity to an innocent mode-sharing?"
CONTRIBUTING FACTORS:

SUMMARY

"Tobacco products are effective delivery systems for the highly addictive drug nicotine. Nicotine activates the dopamine reward pathway in the brain, which reinforces continued tobacco use. Nicotine dependence and withdrawal are DSM-IV psychiatric disorders. Tobacco dependence involves biological, psychological, social, systemic and treatment factors requiring a long-term multifaceted treatment approach."