Principles of Addiction
Definitions, Public Health, and Treatment

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Addiction

Heroin

Alcohol

Tobacco

Cocaine

Prescription Opioids
Overview

*Addiction is a chronic, relapsing, brain disease*

- Definitions
- Public health perspective
- Treatment principles
Case Presentation
(12/99)

• Mr. CB, 42 y/o male, presented to ED with chief complaint “belly pain.”

• Moderately severe mid-abdominal pain increasing over 3 weeks
Hospitalization

(11/99) 1 month prior to current admission

- Addiction
  - Injection drug use (IDU) for 10 years
  - Heroin withdrawal symptoms
  - Vague alcohol use

- Endocarditis
  - LVEF 75%, mitral valve vegetation
  - Antibiotics for 6 weeks

- Abdominal pain onset during hospitalization
  - CT abd & KUB unremarkable
  - Dx: constipation
  - Rx: laxatives & manual disimpaction

42 y/o male
Initial Evaluation
(12/99)

- 42 y/o male
- 11/99 endocarditis
- LVEF 75%
- 12/99 c/c "abd pain"

- "Cramping" pain, constipation, poor PO intake

- Intranasal heroin use "to treat abdominal pain" past 10 days

- No recent IDU

- Smoked 10 cigarettes/day
Physical Exam

- 42 y/o male
- 11/99 endocarditis
- LVEF 75%
- 12/99 c/c “abd pain”

- Pleasant male NAD
- P: 95, R: 18, weight: 120 lbs, afebrile
- Nodes: bilateral cervical and axillary adenopathy
- CV: III/VI holosystolic murmur RUSB radiating to axilla
- Abd: tender RLQ and LLQ without rebound
- Rectal: no focal tenderness; stool brown guaiac negative
- WBC: 5.1, Hct: 26, Plts: 267K
Overview

Addiction is a chronic, relapsing, brain disease

- Definitions
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Definitions

- Drug/Alcohol abuse
- Drug/Alcohol dependence
- Addiction
Patterns of Substance Use

- Abstinence
- Moderate use
- Hazardous use
- Harmful use/abuse
- Dependence

Asymptomatic

Clinically apparent
DSM IV Criteria: Drug Abuse

1 or more of the following in a year:

- Recurrent use resulting in failure to fulfill major role obligations
- Recurrent use in hazardous situations
- Recurrent drug-related legal problems
- Continued use despite social or interpersonal problems caused or exacerbated by drugs
DSM IV Criteria: Drug Dependence

3 or more of the following in a year:

- **Tolerance**
- **Withdrawal**
  - A great deal of time spent to obtain drugs, use them, or recover from their effects
  - Important activities given up or reduced because of drugs
- Using more or longer than intended
- Persistent desire or unsuccessful efforts to cut down or control substance use
- Use continued despite knowledge of having a persistent or recurrent physical or psychological problem caused or exacerbated by drug use
Addiction

• Characterized by behaviors that include 1 or more of the following:* 
  – Loss of control with drug use 
  – Compulsive drug use 
  – Continued use despite harm 

• A condition involving activation of the brain’s mesolimbic dopamine system; a common denominator in the acute effects of drugs of abuse†

†Leshner AI. JAMA. 1999; 282:1314-1316.
Medical Record Review

- 42 y/o male
- 11/99 endocarditis
- LVEF 75%
- 12/99-c/c- "abd pain"

- Several urgent care and ED visits over past 10 years
- No prior primary care
- No mention of alcohol or drug abuse
Overview

Addiction is a chronic, relapsing, brain disease

• Definitions
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• Treatment principles
### Estimated leading causes of Disability-Adjusted Life-Years (DALYs) in the US in 1996: Males

<table>
<thead>
<tr>
<th>Rank</th>
<th>Cause</th>
<th>DALYS</th>
<th>%Total DALYS</th>
<th>Deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All Conditions</td>
<td>18,314,401</td>
<td>100</td>
<td>1,163,569</td>
</tr>
<tr>
<td>1</td>
<td>Ischemic heart disease</td>
<td>1,969,256</td>
<td>10.75</td>
<td>286,999</td>
</tr>
<tr>
<td>2</td>
<td>Road Traffic Collisions</td>
<td>933,953</td>
<td>5.1</td>
<td>29,105</td>
</tr>
<tr>
<td>3</td>
<td>Lung, trachea cancers</td>
<td>812,675</td>
<td>4.44</td>
<td>102,071</td>
</tr>
<tr>
<td>4</td>
<td>HIV/AIDS</td>
<td>773,640</td>
<td>4.22</td>
<td>25,307</td>
</tr>
<tr>
<td>5</td>
<td>Alcohol abuse/dependence</td>
<td>736,572</td>
<td>4.02</td>
<td>5,231</td>
</tr>
<tr>
<td>6</td>
<td>Cerebrovascular disease</td>
<td>673,877</td>
<td>3.68</td>
<td>63,126</td>
</tr>
<tr>
<td>7</td>
<td>Homicide and violence</td>
<td>567,322</td>
<td>3.1</td>
<td>17,391</td>
</tr>
<tr>
<td>8</td>
<td>Chronic obstructive pulmonary disease</td>
<td>545,350</td>
<td>2.98</td>
<td>52,489</td>
</tr>
<tr>
<td>9</td>
<td>Self-inflicted</td>
<td>541,640</td>
<td>2.96</td>
<td>25,647</td>
</tr>
<tr>
<td>10</td>
<td>Unipolar major depression</td>
<td>477,040</td>
<td>2.6</td>
<td>12</td>
</tr>
<tr>
<td>11</td>
<td>Drug use</td>
<td>467,127</td>
<td>2.55</td>
<td>1,194</td>
</tr>
</tbody>
</table>

Estimated Leading Causes of Disability-Adjusted Life-Years (DALYS) in the U.S., 1996

<table>
<thead>
<tr>
<th>Rank</th>
<th>Condition</th>
<th>Women (1,000,000)</th>
<th>DALYS (1,000,000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ischemic heart disease</td>
<td>1,181,298</td>
<td>249,315</td>
</tr>
<tr>
<td>2</td>
<td>Unipolar major depression</td>
<td>1,073,911</td>
<td>25</td>
</tr>
<tr>
<td>3</td>
<td>Cerebrovascular disease</td>
<td>836,345</td>
<td>98,551</td>
</tr>
<tr>
<td>4</td>
<td>Lung, trachea, and bronchus cancers</td>
<td>549,963</td>
<td>66,134</td>
</tr>
<tr>
<td>5</td>
<td>Osteoarthritis</td>
<td>521,443</td>
<td>508</td>
</tr>
<tr>
<td>6</td>
<td>Breast cancer</td>
<td>514,729</td>
<td>46,649</td>
</tr>
<tr>
<td>7</td>
<td>Chronic obstructive pulmonary disease</td>
<td>510,084</td>
<td>47,576</td>
</tr>
<tr>
<td>8</td>
<td>Dementia and other degenerative and hereditary central nervous system disorders</td>
<td>506,858</td>
<td>29,139</td>
</tr>
<tr>
<td>9</td>
<td>Diabetes mellitus</td>
<td>500,932</td>
<td>34,489</td>
</tr>
<tr>
<td>10</td>
<td>Road traffic collisions</td>
<td>459,489</td>
<td>14,630</td>
</tr>
<tr>
<td>11</td>
<td>Alcohol abuse and dependence</td>
<td>414,792</td>
<td>14,444</td>
</tr>
</tbody>
</table>

## Estimated Economic Costs of Drug and Alcohol Abuse in the U.S. (in billions)

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost (in billions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health care expenditures (e.g., Specialty treatment, prevention, research, and medical consequences)</td>
<td>$42.1</td>
</tr>
<tr>
<td>Productivity losses</td>
<td>$262.8</td>
</tr>
<tr>
<td>Other effects (e.g., criminal justice, property)</td>
<td>$60.5</td>
</tr>
<tr>
<td><strong>Total costs</strong></td>
<td><strong>$365.4</strong></td>
</tr>
</tbody>
</table>


Who Bears the Cost of Substance Abuse?


Total Estimated Costs for 1992: $97.7 Billion

Billions of Dollars

Government & Their Households
Drug Abusers
Victims
Private Insurance

CRIT 2011
Week 1—Hospitalization (12/99)

- 42 y/o male
- 11/99 endocarditis
- LVEF 75%
- 12/99 c/c “abd pain”

- Blood cultures negative
- Methadone
- Pain medications
- Abd w/: surg consult, imaging studies UGI SBFT
  - “Focal area of small bowel dilatation and loss of mucosal folds within the mid to distal ileum. Differential diagnosis includes a small bowel lymphoma, however, inflammatory bowel disease and mastocytosis can also be considered.”
- Cardiac Echo LVEF 70%; vegetation no longer visible
Week 2—Hospitalization  
(12/99–1/00)

- 42 y/o male
- 11/99 endocarditis
- LVEF 75%
- 12/99-c/c- "abdominal pain"
- UGI: abnormal

- Abd pain and poor PO intake persisted

- HBSAg-, HBCAb+ (past Hepatitis B, resolved)

- HCV Ab+ (Hepatitis C)

- HIV+, CD4 503, HVL 15,085
Mr. CB

• What is your leading diagnosis?

• What is your next diagnostic test?

-42 y/o male
-11/99 endocarditis
-LVEF 75%
-12/99-c/c- "abd pain"
-UGI - abnormal
-HIV+, HCV+ CD4 503
Week 2—Hospitalization (1/00)

-42 y/o male
-11/99 endocarditis
-LVEF 75%
-12/99-c/c-”abd pain”
-UGI - abnormal
-HIV+, HCV+
CD4 503

• CT with angiogram
  – Superior Mesenteric Artery (SMA) occlusion possibly secondary to mitral valve vegetation embolus
  – Dx: ischemic colitis
  – Transferred to surgery for partial colectomy
Mesenteric Vascular Occlusion
Overview

Addiction is a chronic, relapsing, brain disease

• Definitions
• Public health perspective
• Treatment principles
Treatment Effectiveness

- 50% to 80% return to previous pattern of substance use during the first year after treatment.
- Most important predictors of relapse:
  - Low socioeconomic status
  - Comorbid psychiatric conditions
  - Lack of family and social support

1. No single treatment is appropriate for all individuals.

2. Treatment needs to be readily available.

3. Effective treatment attends to multiple needs of the individual, not just his or her drug use.

4. An individual’s treatment and services plan must be assessed continually and modified as necessary to ensure that the plan meets the person’s changing needs.

5. Remaining in treatment for an adequate period of time is critical for treatment effectiveness.
6. Counseling and other behavioral therapies are critical components of effective treatment for addiction.

7. Medications are an important element of treatment for many patients, especially when combined with counseling and other behavioral therapies.

8. Addicted or drug-abusing individuals with coexisting mental disorders should have both disorders treated in an integrated way.

9. Medical detoxification is only the first stage and by itself does little to change long-term drug use.
10. Treatment does not need to be voluntary to be effective.

11. Possible drug use during treatment must be monitored continuously.

12. Treatment programs should provide assessment for HIV/AIDS, Hep B & C, TB, and other infectious diseases, and counseling to help patients modify or change behaviors that place themselves or others at risk of infection.

13. Recovery from drug addiction can be a long-term process and frequently requires multiple episodes of treatment.
The Most Effective Treatment Strategies Will Attend to All Aspects of Addiction:

- Biology
- Behavior
- Social Context
Principles of Addiction

CONCLUSIONS

• Addiction is a chronic, relapsing brain disease and comes at a high cost to society.

• There are multiple treatment approaches for addiction and they are most effective when used in combination.

• NIDA’s “Principles of Effective Drug Addiction Treatment” offers useful guidelines for physicians.