



as other drug use, residual drug effects, or withdrawal symptoms in long-term chronic users.

### ***Addictive Potential***

Long-term marijuana abuse can lead to addiction; that is, compulsive drug seeking and abuse despite the known harmful effects upon functioning in the context of family, school, work, and recreational activities. Estimates from research suggest that about 9 percent of users become addicted to marijuana; this number increases among those who start young (to about 17 percent) and among daily users (25–50 percent).

Long-term marijuana abusers trying to quit report withdrawal symptoms including: irritability, sleeplessness, decreased appetite, anxiety, and drug craving, all of which can make it difficult to remain abstinent. These symptoms begin within about 1 day following abstinence, peak at 2–3 days, and subside within 1 or 2 weeks following drug cessation.<sup>3</sup>

### ***Marijuana and Mental Health***

A number of studies have shown an association between chronic marijuana use and increased rates of anxiety, depression, and schizophrenia. Some of these studies have shown age at first use to be an important risk factor, where early use is a marker of increased vulnerability to later

problems. However, at this time, it is not clear whether marijuana use causes mental problems, exacerbates them, or reflects an attempt to self-medicate symptoms already in existence.

Chronic marijuana use, especially in a very young person, may also be a marker of risk for mental illnesses—including addiction—stemming from genetic or environmental vulnerabilities, such as early exposure to stress or violence. Currently, the strongest evidence links marijuana use and schizophrenia and/or related disorders.<sup>4</sup> High doses of marijuana can produce an acute psychotic reaction; in addition, use of the drug may trigger the onset or relapse of schizophrenia in vulnerable individuals.

## **What Other Adverse Effects Does Marijuana Have on Health?**

### ***Effects on the Heart***

Marijuana increases heart rate by 20–100 percent shortly after smoking; this effect can last up to 3 hours. In one study, it was estimated that marijuana users have a 4.8-

### ***Effects on the Lungs***

Numerous studies have shown marijuana smoke to contain carcinogens and to be an irritant to the lungs. In fact, marijuana smoke contains 50–70 percent more carcinogenic hydrocarbons than tobacco smoke. Marijuana users usually inhale more deeply and hold their breath longer than tobacco smokers do, which further increase the lungs' exposure to carcinogenic smoke. Marijuana smokers show dysregulated growth of epithelial cells in their lung tissue, which could lead to cancer;<sup>6</sup> however, a recent case-controlled study found no positive associations between marijuana use and lung, upper respiratory, or upper digestive tract cancers.<sup>7</sup>

admissions were primarily male (74 percent), White (49 percent), and young (30 percent were in the 12–17 age range). Those in treatment for primary marijuana abuse had begun use at an early age: 56 percent by age 14.<sup>††</sup>

### ***Is Marijuana Medicine?***

The potential medicinal properties of marijuana have been the subject of substantive research and heated debate. Scientists have confirmed that the cannabis plant contains active ingredients with therapeutic potential for relieving pain, controlling nausea, stimulating appetite, and decreasing ocular pressure. Cannabinoid-based medications include synthetic compounds, such as dronabinol (Marinol<sup>®</sup>) and nabilone (Cesamet<sup>®</sup>), which are FDA approved, and a new, chemically pure mixture of plant-derived THC and cannabidiol called Sativex<sup>®</sup>, formulated as a mouth spray and approved in Canada and parts of Europe for the relief of cancer-associated pain and spasticity and

Marijuana Use by Students  
2009 Monitoring the Future Survey

|           | 8th Grade | 10th Grade | 12th Grade |
|-----------|-----------|------------|------------|
| Lifetime* | 15.7%     | 32.3%      | 42.0%      |
| Past Year | 11.8%     | 26.7%      | 32.8%      |
|           |           |            |            |
|           |           |            |            |