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In This Issue...

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Adolescent exposure to marijuana linked to adverse effects in adulthood

Exposure to cannabis in adolescence is associated with possible harmful cognitive and affective outcomes in adulthood, researchers have found. In a study published in the March issue of the *Journal of the American Academy of Child and Adolescent Psychiatry*, Amir Levine, M.D., and colleagues conducted a literature search examining the potential effects of exposure to cannabis and related synthetic cannabinoids during adolescence. They found that regardless of whether cannabis causes these consequences, youth who are exposed are also at higher risk for potential psychiatric morbidity and learning problems, as well as suicidality and addiction as adults. The earlier the onset of cannabis use, the higher the risk for problems in adulthood, according to the study, titled "Evidence for the Risks and Consequences of Adolescent Cannabis Exposure."

Most of the clinical and preclinical (animal) data found a strong correlation between adolescent canna-

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Bottom Line...

Marijuana use by adolescents is linked to long-term adverse psychiatric consequences, but whether that link is causal is not clear based on clinical research alone. Animal research suggests it may be causal.

Provider-insurer dispute over payments leads to cross-allegations of fraud

A legal dispute between an Iowa for-profit addiction treatment program and a major insurer now has each party accusing the other of fraudulent activity, with the defendant insurance company alleging in a new court filing that the provider coerced vulnerable patients into enrolling in or maintaining private insurance.

The latest allegation came in a formal response issued this month by Wellmark Blue Cross & Blue Shield, in which it states that Des Moines, Iowa–based St. Gregory Retreat Centers falsely told criminal justice clients that Medicaid would not cover their postrelease treatment and that they needed to apply for Wellmark coverage. Moreover, the insurer contends that St. Gregory suggested to these individuals that they could be returned to jail if they did not comply with the request.

St. Gregory and the justice services program it oversees, the Alternative Legal Placement Program (ALPP), strongly deny the insurer's allegations, calling them a retaliatory move against the organizations' at-

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Bottom Line...

St. Gregory Retreat Centers and Wellmark Blue Cross & Blue Shield each have accused the other of fraud in a dispute involving costly substance use treatment services for an offender population.

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binoid exposure and adverse, persistent psychiatric problems in adulthood. However, the literature does not prove that cannabis alone is causing these deficits in humans. In animals, however, there is a clear indication that cannabis exposure that starts in adolescence leads to molecular processes that cause persistent functional deficits in adulthood.

Increasing use

Not since 1933, when prohibition was repealed, has there been so much support for legalization of a criminalized substance, the researchers write. "The trajectory is clear: legalized cannabis is the fastest growing market in the United States," they write. Even though access to cannabis is denied to people under 21, younger people will still be able to acquire it, just as they can alcohol and tobacco. More high school seniors now use marijuana than cigarettes, with 6 to 7 percent reporting daily or almost-daily use, and more than 38 percent reporting use in the past year.

Most of the studies of adolescent cannabis use in humans identify at least one poor outcome related to mental health in adulthood, specifically linking early-onset use with deficits in cognition and memory, as well as an increase in affective and psychotic disorders, and a transition to substance use disorders in adulthood. While these outcomes are disproportionately represented among those who started cannabis use in early adolescence and were frequent users, the studies were not conclusive.

'The earlier the onset of use, and the more frequent the use, the higher the risk.'

Amir Levine, M.D., et al.

One big problem is ethical and logical limitations in conducting cannabis research on adolescents. The studies are observational, as it would not be ethical to give human adolescents marijuana as part of a controlled trial because of the "unknown safety of pediatric cannabis exposure," the researchers note. Therefore, it's very difficult to control for pre-existing confounders — traits in the cannabis users or other factors that might themselves have led to the adverse outcomes. Twin studies and genomewide association studies have shown that the decision to use cannabis, as well as the development of problematic use, may have a genetic component. In addition, the same variants involved in cannabis consumption are also involved in schizophrenia and depression. Recently, some studies have looked at the possibility that early cannabis use is associated with specific alleles (a gene alternative found on the same chromosome).

The "gateway" theory that has been popular in some arenas and debunked in others does have grounding in fact, at least in the past. For decades, the pattern of consumption among teens was first alcohol and cigarettes, then cannabis, and then other drugs, such as opioids and stimulants. Recently, however, teens have been more likely to try cannabis first. Even infrequent teen use of cannabis is linked to an eightfold increase in the use of nicotine, compared to teens who don't use cannabis. Among adults reporting illicit drug use, such as cocaine, methamphetamine or heroin use, adolescent cannabis use overwhelmingly came first.

Animal models

Animal models can control for premorbid traits, dosing schedules, age of first drug exposure and the washout duration preceding behavioral and molecular testing. Persistent deficits in adult memory and learning were among the first reported outcomes of adolescent can-

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nabinoid exposure in rodents. But two studies using lower doses of THC, most closely resembling the mild patterns of cannabis use most common among adolescents, found no long-term deficits. A prolonged washout period into adulthood also resulted in no observed impairment.

Collectively, the animal studies provide molecular and behavioral evidence of an adolescent vulnerability to cannabinoid-induced memory impairments that are structurally related to hippocampal abnormalities after exposure to higher levels of cannabinoids.

The findings point to the potential risk that the rising potency of cannabis products and the accessibility of synthetic cannabinoids may result in an increase in long-term learning and memory impairments among adolescent-onset users. So far, in humans, the effect of cannabis on hippocampal development in adolescence has not been examined extensively, and the animal findings suggest this is an area warranting further study.

For schizophrenia, animal research has used a positive symptom, called prepulse inhibition, which assesses the ability to obtain and process information and is often impaired in humans with psychotic disorders. Animal models of psychotic disorders have close overlap with animal models of cannabis-induced cognitive and emotional alterations. In humans, a decrease in prepulse inhibition is strongly correlated with the presence of psychotic disorders, and is also impaired in people who abuse cannabis.

Clinical research

"The increasing acceptance of medicinal and recreational cannabis use in our society, and the policy and legislative changes that have followed and occasioned this, are largely based on research and experience derived from, and pertinent to, adults," the researchers conclude. "From the clinical research, we find a connection repeatedly drawn between adolescent cannabis use and poorer life outcomes, and when examining the preclinical research, we find evidence to suggest that predisposing genetic or sociocultural aspects do not fully account for the poor functional outcomes observed in adults who initiate cannabis use in adolescence." However, animal and clinical research do not always connect well.

"There is a need for additional, rigorous research to determine whether earlier age of onset and a heavier pattern of use play causal roles in increasing one's risk for persistent, if not permanent, impairments in mental health and cognition later in life," they write. "We cannot yet say whether there is or is not a specific amount of cannabis that youth can 'safely' consume, but it remains important for clinicians to keep in mind that youth who use cannabis on the whole represent an at-risk group for potential cognitive difficulties and psychiatric morbidity, including suicidality. The earlier the onset of use, and the more frequent the use, the higher the risk."

Future research will require carefully designed animal models and longitudinal studies to discover whether cannabis use alone has a deleterious impact on the human adolescent brain, the researchers concluded. •

NAATP commits to 12-Step and medication-assisted treatment

The National Association of Addiction Treatment Providers earlier this month released its new policy statement, clearly outlining the organization's endorsement of 12-Step methodology as well as medication-assisted treatment, the importance of residential treatment and abstinence, the need for research into outcomes and its opposition to the use of marijuana either recreationally or medically without approval by the Food and Drug Administration. What follows are the key points of the policy, which was adopted last month:

- Addiction, also called Substance Use Disorder (SUD), is a primary, chronic, and potentially fatal brain disease characterized by biological, psychological, social, and spiritual manifestations.
- Addiction is best treated by an integrated and comprehensive model of care that addresses the medical, biological, psychological, social, and spiritual needs of individuals impacted by the disease of addiction.
- Best practices in the treatment of addiction occur along a continuum of care wherein an individual's needs are addressed for biological, psychological, social, and spiritual care from assessment and diagnosis to stabilization and detoxification, primary residential and outpatient treatment, and the options for long term recovery maintenance.
- Residential treatment is vital, necessary, and essential in the full continuum of care as a choice for the treatment of the chronic disease of addiction.
- Abstinence from all addictive drugs is an optimal component of wellness and lifelong recovery. Depending on bio-psycho-social and medical factors, there may be persons who require medication assisted treatment for extended periods of time, as medically indicated. However, medication alone is never sufficient to maintain long-term recovery.
- Twelve-Step Addiction Treatment is an effective method of addiction treatment.
- Outcomes data that assess ef-

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