

AMERICAN ACADEMY OF PEDIATRICS

Committee on Adolescence
Committee on Substance Abuse

Marijuana: A Continuing Concern for Pediatricians

During the past quarter century, marijuana use by young people has evolved from an uncommon behavior to the current situation in which marijuana is the most common illicit drug chosen by teenagers. Among high school seniors in the United States more than half have used marijuana at least once. Approximately one fourth of these seniors reported use during the prior month, with some 4% reporting daily use. Marijuana use often begins early in adolescence with more than 25% of all teenagers reporting that they used the drug prior to entering the tenth grade.¹ This statement is an update of a previous statement written by the American Academy of Pediatrics on marijuana use² and is an adjunct to the Academy's statement on "The Role of the Pediatrician in Substance Abuse Counseling."³

Concurrent with the rapid increase in the popularity of marijuana there has been a continuing national debate regarding not only the potential health hazards of this drug but also the issues of legalization, decriminalization, and the morality of any drug use by young people. Amid this debate, pediatricians are obligated to develop a reasoned approach to dealing with marijuana use by adolescents, so they can provide appropriate care and counsel to both young people and their parents. Such an approach should be based on an appreciation of the somatic and behavioral consequences of marijuana use.

The recommendations in this publication do not indicate an exclusive course of treatment or serve as a standard of medical care. Variations, taking into account individual circumstances, may be appropriate.

This statement has been approved by the Council on Child and Adolescent Health.

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SOMATIC CONSEQUENCES

Marijuana should not be considered a benign drug. Marijuana use has been associated with cardiovascular, pulmonary, reproductive, and possible immunologic consequences. The physiologic effects of marijuana use include accelerated heart rate and a minimal rise in blood pressure.^{4,5} These effects, which appear to be secondary to β -adrenergic vascular mechanisms, are transient and usually are not deleterious to the otherwise healthy adolescent. The immediate pulmonary effect of smoking marijuana is bronchodilation. With chronic use, the smoked particles act as an irritant, causing bronchoconstriction and eventually airway obstruction.⁶⁻⁹ The chronic effects of smoking marijuana are similar to those of smoking tobacco. As with smoking tobacco there appears to be a relationship between smoking marijuana and eventual neoplastic changes in the lungs.¹⁰

Heavy marijuana use has been associated with diminished sperm motility, decreased sperm counts, and decreased circulating testosterone levels.^{11,12} Animal data demonstrate that heavy marijuana use interferes with ovulation and causes a decrease in pituitary gonadotropin.¹³ This provides further cause for concern about marijuana use by adolescents still undergoing puberty. In studies involving pregnant animals, it has been shown that metabolites of marijuana cross the placenta, are teratogenic, and retard fetal growth. However, similar studies in humans remain inconclusive.^{14,15} In addition, questions remain about whether the long-term use of marijuana suppresses cellular-mediated immunity and diminishes circulating immunoglobulin, subjecting the chronic user to an increased risk of infectious illness.¹⁶

BEHAVIORAL CONSEQUENCES

Marijuana use can cause serious behavioral effects. Acutely, marijuana produces euphoria, relax-

ation, and disinhibition.¹⁷ In addition, other adverse consequences of marijuana use include interference with: (a) coordination; (b) the ability to judge elapsed time, speed, and distance; (c) the ability to track a moving object; and (d) reaction time.¹⁸⁻²¹ There is little doubt that marijuana intoxication contributes significantly to accidental death and injury among adolescents and, in particular, those associated with automotive collisions.²²

Marijuana use also exerts a negative effect on learning and memory.²³ Marijuana intoxication causes interference with normal attention processes and with acquiring and storing information. It also reduces problem-solving skills. Individuals under the influence of marijuana have difficulty organizing their thoughts and conversing.²⁴⁻²⁶

An "amotivational syndrome" has been described in chronic heavy marijuana users. This syndrome is characterized by an inability to sustain attention on environmental stimuli and to maintain goal-directed thinking or goal-directed behavior.²⁷ An additional source of concern is the occasional occurrence of dysphoric reactions that may range from mild fear to depersonalization to frank paranoia.^{28,29}

Finally, marijuana use often precedes the use of other more dangerous drugs. Although marijuana use does not necessarily predict a progression to harder drugs, the role of marijuana as a potential "gateway drug" for some teenagers must be considered.

CONCLUSIONS

1. Marijuana use continues to be widespread among adolescents.

2. The seriousness of the behavioral consequences of marijuana use is sufficient to cause great concern and prompt the pediatrician to counsel young people against any use of the drug. Such counsel should be based on health concerns, including the relationship of marijuana use to both trauma associated with intoxication and the impact on memory and learning. Additional reasons for concern, and hence counsel, include anxieties and uncertainties regarding the potential harm that marijuana use may cause to adolescents undergoing hormonal development, possible teratogenicity, and the known consequences of chronic use.

3. A psychosocial and medical assessment for drug use, including use of marijuana, should be a routine part of health maintenance for every young person.³ Performing such assessments gives the pediatrician the opportunity to offer anticipatory guidance prior to the onset of drug use behavior, to intervene and minimize consequences if drug use

has been initiated, and to detect and address issues of chronic or heavy use.

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REFERENCES

1. Johnston LD, O'Malley PM, Backman JG. *National Trends in Drug Use and Related Factors Among American High School Students and Young Adults, 1975-1986*. Rockville, MD: National Institute of Drug Abuse. 1987. Publication (ADM) 87-1535
2. American Academy of Pediatrics, Committee on Adolescence. Marijuana: new concerns about an old drug. *News and Comment*. 1982;33:9
3. American Academy of Pediatrics, Committee on Adolescence. The role of the pediatrician in substance abuse counseling. *Pediatrics*. 1983;72:251-252
4. Beaconsfield P, Ginsburg J, Rainsbury R. Marijuana smoking: cardiovascular effects in man and possible mechanisms. *N Engl J Med*. 1972;287:209-212
5. Weiss JL, Watanabe AM, Lemberger L, et al. Cardiovascular effects of delta-9-tetrahydrocannabinol in man. *Clin Pharmacol Ther*. 1972;13:671-684
6. Vachon L, Fitzgerald MX, Solliday NH, et al. Single-dose effects of marijuana smoke: bronchial dynamics and respiratory-center sensitivity in normal subjects. *N Engl J Med*. 1973;288:985-989
7. Tashkin DP, Shapiro BJ, Frank IM. Acute pulmonary physiologic effects of smoked marijuana and oral tetrahydrocann

- nabinol in healthy young men. *N Engl J Med.* 1973;289:336-341
8. Tennant FS. Histopathologic and clinical abnormalities of the respiratory system in chronic hashish smokers. *Subst Alcohol Actions-Misuse.* 1980;1:93-100
 9. Wu TC, Tashkin DP, Djahed B, Rose JE. Pulmonary hazards of smoking marijuana as compared with tobacco. *N Engl J Med.* 1988;318:347-351
 10. Cottrell JC, Sohn SS, Vogel WH. Toxic effects of marijuana tar on mouse skin. *Arch Environ Health.* 1973;26:277-278
 11. Hembrec WC, Nahas GG, Zeidenberg P, et al. Changes in human spermatozoa associated with high dose marijuana smoking. In: Nahas GG, Paton WDM, eds. *Marihuana: Biological Effects, Analysis, Metabolism, Cellular Responses, Reproduction and Brain.* Oxford, England: Pergamon Press; 1979;429-439
 12. Kolodny RC, Masters WH, Kolodner RM, Toro G. Depression of plasma testosterone levels after chronic intensive marijuana use. *N Engl J Med.* 1974;290:872-874
 13. Asch RH, Smith CG, Siler-Khodr TM, Pauerstein CJ. Effects of delta-9-tetrahydrocannabinol during the follicular phase of the rhesus monkey. *J Clin Endocrinol Metab.* 1981;52:50-55
 14. Harbison RD, Matilla-Plata B. Prenatal toxicity, maternal distribution and placental transfer of tetrahydrocannabinol. *J Pharmacol Exp Ther.* 1972;180:446-453
 15. Linn S, Schoenbaum SC, Monson RR, Rosner R, Stubblefield PC, Ryan KJ. The association of marijuana use with outcome of pregnancy. *Am J Public Health.* 1983;73:1161-1164
 16. American Medical Association, Council on Scientific Affairs. Marijuana: its health hazards and therapeutic potentials. *JAMA.* 1981;246:1823-1827
 17. Tart CT. Marijuana intoxication: common experiences. *Nature.* 1970;226:701-704
 18. Milstein SL, MacCannell K, Karr G, Clark S. Marijuana-produced impairments of coordination: experienced and nonexperienced subjects. *J Nerv Ment Dis.* 1975;161:26-31
 19. Evans MA, Martz R, Brown DJ, et al. Impairment of performance with low doses of marijuana. *Clin Pharmacol Ther.* 1973;14:936-940
 20. Moskowitz H, Sharma S, Zeidman K. Duration of skills performance impairment under marijuana. American Association for Automotive Medicine Proceedings; October 1-3, 1981; San Francisco, CA. pp 87-96
 21. Sharma S, Moskowitz H. Effects of two levels of attention demand on vigilance performance under marijuana. *Percept Mot Skills.* 1974;38:967-970
 22. Cimbura G, Warren RA, Bennett RC, et al. *Drugs Detected in Fatally Injured Drivers and Pedestrians in the Province of Ontario.* Ottawa, Ontario, Canada: Traffic Injury Research Foundation of Canada; 1980
 23. Schwartz RH, Gruenewald PJ, Klitzner M, Fedio P. Short-term memory impairment in cannabis-dependent adolescents. *AJDC.* 1989;143:1214-1219
 24. Vachon L, Sulkowski A, Rich E. Marijuana effects on learning, attention, and time estimation. *Psychopharmacologia.* 1974;39:1-11
 25. Belmore SM, Miller LL. Levels of processing and acute effects of marijuana on memory. *Pharmacol Biochem Behav.* 1980;13:199-203
 26. Darley CF, Tinklenberg JR, Roth WT, Vernon S, Kopele BS. Marijuana effects on long-term memory assessment and retrieval. *Psychopharmacology.* 1977;52:239-241
 27. Weller RA. Marijuana: effects and motivation. *Med Aspects Human Sexuality.* 1985;19:92-105
 28. Keeler MH. Adverse reaction to marijuana. *Am J Psychiatry.* 1967;124:674-677
 29. Weil AT. Adverse reactions to marijuana: classification and suggested treatment. *N Engl J Med.* 1970;282:997-1000

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