

# Cannabis and health: from myth to evidence

## Abstract

It shows the presentation of the book of the same title, which occurred April 20, 2017 at the National Institute of Psychiatry Ramón de la Fuente (Mexico). It describes the biomedical point of view about Cannabis. This review includes studies published in the last 40 years. It is based on the Lexicon of the WHO and joins addictive disorders with mental disorders that make up the current vision of Dual Pathology, carrying high proportion consumers of this drug. It explains the effect of any substance in the light of the epidemiological triad (agent, guest and environment), contrasting with the reduced and biased popular view for this purpose. It refers to Cannabis and its derivatives from its pharmacokinetics, pharmacodynamics, and their harmful effects in special on the child/youth population, the most vulnerable of all.<sup>1</sup> Some possible medical uses of the psychotropic are discussed under the premise that it should be schools, councils, schools of medical specialties and health authorities of the country, who grant approval for its use. Clinical descriptions depart epidemiological data, through whose vision clinical pictures classified in ICD-10 are reviewed to found the therapeutic options. Some reasons that determine the type of consumption that leads to abuse and dependence, individual, family and social consequences as violence and associated psychopathology are reviewed.<sup>2</sup> It raises the essential clinical evaluation of cases of induced disorder by use of Cannabis and other mental disorders, objectives and goals for handling that corroborate Dual Pathology in many consumers.<sup>3,4</sup> It emphasizes the doctor-patient relationship, the therapeutic alliance and adherence to treatment, as essential elements of any therapeutic.<sup>5</sup> Within the framework of such complementarity, psychotherapy and its procedures support the pharmacological management, so actions for rehabilitation facilitate social reintegration of patients.<sup>2</sup> Assertions with regard to the harmlessness of Cannabis are demystified and it concludes with reflections on the legalization and its inconvenience, in the light of the international recommendations,<sup>6</sup> once the concepts of "Legalization, decriminalization and indiscriminate or free marketing", recreational use, "Recreational use", etc. are clarified based on international technical terminology. The "right to decide on the healthy development of personality" is questioned, as each individual does not have: individuation, independence, autonomy, knowledge, will, self-criticism, judgment and effective use of such resources, there is no such right. The text concludes with ethical reflections from the point of view humanistic medicine.<sup>7</sup>

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## Introduction

The title of the book Cannabis and health, from myth to evidence refers to the set of mythology and popular ignorance, as well as hope to achieve with the technical and scientific knowledge, a collective welfare. The text shows the scientific point of view about Cannabis, based on the documentary evidence of the past 45 years. It is a book that does not resemble to any other. The revision contains selected information taken from sources of high technical and scientific credibility, nurtured by studies and research from professional authorities in the matter, researchers, clinicians, and teachers with experience, that provide the established opinion which sustains the science journalism intended to carry out about this complex issue. Yes, indeed, by the consumption of Cannabis multiple physical, psychic development and social damages have been documented.<sup>8</sup> The most vulnerable to its effects is the adolescent population and in it, it is precisely the most harmful. Epidemiological, clinical and laboratory studies of recent decades indicate an association between the consumption of Cannabis and multiple adverse health outcomes, as well as the dependence and withdrawal syndromes, alterations in the development of psychophysical and relationship functions in adolescents and adults on their mental health.<sup>9</sup> Hence in the diagnostic and therapeutic approach of the consumer, it should be considered the participation of the history of addictive or mental disorder also in parents as: separation; family conflicts; home-based violence;

physical or sexual abuse; poverty and/or disruption; serious and/or chronic diseases, disasters either natural or war, among others. The family perceptions about the "safety of the effect of drugs" during the adolescent stage of the children is completely false. Just as they do the stressful elements in life, which require an appropriate adaptation period to retake the stability, which if not achieved, would increase psychopathology, in the same way that the initiation of psychotropics, where it is usual to find that they start with tobacco, Cannabis, alcohol, cocaine, methphetamines, etc. The information available on several alterations confirms that they are older; smaller is the age of onset of consumption, due to the lack of maturation of prefrontal cortex. Scientific evidence indicates that smoked Cannabis, far from being harmless and medicinal - as some would like, for various reasons unrelated to health and to the collective welfare-, is harmful, thanks to its neurotoxic and addictive nature for the human brain.<sup>8,10</sup> Note that in modern medicine, no smoked substance is considered medicine - except perhaps, electronic cigarettes. But the most important case to point out is that in most cases, the consumer ignores possible predisposition, taken into his mental and physical condition at the time of first use, and only or with other psychotropic substances, which makes it exposed and at risk more on every occasion. Cannabis is the most consumed illicit drug in the world, excluding alcohol and tobacco which still being toxic, are legal and are obtained easily by minors, despite the existence of restrictive regulations for them. Its active ingredient Δ9-THC, is not a sedative classic or a psychodisleptic

as such, although some of these effects, by what is a psychotropic with various properties, but with higher unexpected risks than in those ones. It is necessary to clarify that to understand the effects of any substance, drug, drug or psychotropic - far from as people think about it, it must be considered the elements of interaction which promote the body's response: a) the agent, that is to say the origin, purity, quality, contamination with fertilizers, type of substance, dose, route of administration, frequency of application, mixed with other substances, cost, etc., b) the guest, his history of addictive and mental pathology; (pattern of consumption, expectations about the effect and expected impact, intensity and duration, psychiatric comorbidity, personality, medical-psychiatric diagnostics and residual manifestations, etc.), and (c) the environment, i.e., the where, when and with whom consumes, meetings for this purpose, the resources allocated, places, situations, circumstances to achieve it, etc.) so it becomes convenient to dismiss the usual generalizations and simplifications taken by most of the people about this toxic psychotropic.<sup>11</sup>

## Description

A “porro” or cigarette is never equal to another, since the content varies between 2.5 and 5 mg of Δ9- THC, given that they come from different parts of the plant, whose concentration is different. The dose of personal consumption in Mexico (5 gr.) will never be regular as medicines, so the consumer will never know the quantity inhaled or swallowed each time nor its consequences. In fact, ignorance of the individual on his own state of health, could take him beyond a state of mental impairment, serious complications and other various consequences that are often ignored by not being immediate or simply unknown. So in front to the possible change of legal status of Cannabis, we need to clarify “Legalization, decriminalization, and indiscriminate or free marketing” concepts, which are not yet well understood in society. Such arguments are based on the concept of personal consumption or “Recreational” pointed out by the who, which does not apply to the case of Cannabis or other illegal psychotropic substances, because: 1) they aren't safe, 2) they produce dependence and 3) even when used in supposedly “relaxing” social situations, is not possible to regulate its consumed doses without a prescription, i.e. they are consumed by self-medication. The association of Cannabis use with another mental disorder and its documented population expansion is on the rise in the United States as in our country, so the reinforcement of its consumption will increase the damage of the capacity for adjustment expected in adolescents, in early adulthood and later life. In Mexico, the last national survey on illicit drugs indicates that Cannabis is the psychotropic of higher consumption, with 80% of the total consumption of all illegal psychotropic substances. Teenagers have the highest rates of consumption with 4.2 per woman. In female teenagers, Cannabis and cocaine consumption is higher than that reported in adults. Cannabis is 3.3 times more common in them, but the consumption of cocaine in gender is similar. Both are illegal drugs of higher consumption in the country - excluding alcohol which is legal, - with figures of 2.4 Cannabis users by each of cocaine users. Unfortunately, only 20% of addicts – we must mention this fact – attended to treatment (i.e. 2.2 men per woman) and the sum of full and partial treatments does not reach half of the cases.<sup>12</sup> The consumption of Cannabis is often associated with other drugs legal and illegal, alone or in combination such as nicotine, caffeine, cocaine, amphetamines and drugs of design or methamphetamine, methadone, heroin, among others, including some medications or non-controlled ones. By which it should be noted that the frequent combination of alcohol and illegal drugs such as Cannabis and cocaine in many consumers appears in different events and types of violence. For example, the evidence sustains that Cannabis use acts as a component in the cause of psychosis and the production of psychotic episodes.

The increase in risk is more clearly seen in people with certain genetic and/or environmental vulnerability. Therefore, exposure to Cannabis during adolescence, its frequency of use and the use of high levels of the drug, lowers the threshold for the symptoms of schizophrenia and causes impact on the cerebral frontal lobes, involved in functions of social behavior, motivation or reasoning ability. There are, for example, documented cases of use of Cannabis that have precipitated or produced a relapse of schizophrenia.<sup>13-15</sup> In the case of a regular consumer, it will facilitate the risks of progressive toxicity due to their prolonged accumulation.<sup>16</sup> This condition is the one that allows making studies of the presence of Δ9- THC in urine, other than cases of users of other substances. When the consumption is chronic, it is associated with many other disorders, such as: decrease of memory and its progressive deterioration, failures in learning associated with the lack of concentration, impaired executive functions such as judgment, planning, abstraction, decision-making and problem-solving. There are also changes in personality and behavior as impulsivity, aggression, irritability and distrust that generate different pictures of violent conduct. What is striking is that all these changes are often not perceived by the consumer.<sup>10</sup>

Forensic Studies indicate that the most violent cases of death by suicide and many of the accidents are derived from consumption. It is also associated with disorders of sleep, unpleasant dreamy alterations, chronic obstructive pulmonary disease, pulmonary infections and Bullous lung disease, lung cancer. Cardiac arrhythmias and other disorders of the body functioning, linked to tobacco use, are among the patients with intense consumption. Such chronicity to decrease the dose or even no change in consumption is associated with the Amotivational Syndrome, characterized by apathy, conformism, isolation, introversion, loss of ideals, lack of emotion, indifference, lack of affection, loss of personal care, deterioration of social skills, inhibition or decreased sex drive, inability to develop plans for the future, attention decrease, decrease in concentration, decreased ability of calculation, decreased ability of judgment, reflexes decreased, slowness of movements. Other alterations concerning products of pregnant women who keep Cannabis use during pregnancy: under weight and height at birth, cognitive disorders during growth and development responsible for problems in the executive functions, attention, control impulses and aggression.<sup>17</sup> As a result, only with the proper evaluation of the cases it could be expressed a successful clinical opinion, not so with the single view of the user and his cronies. In fact, the self-diagnoses in medicine has no documentary, clinical or legal value, although many people ignore it. The current national therapeutic uses advances in neuroscience by its scientific character and promotion of best technical diagnostic-therapeutic. But poor institutional use in the country, possibly related to a scarce medical and administrative supervision, has supported a clinical modality that still does not usually meet the disorder induced by Cannabis with other mental disorders for its diagnosis and treatment as coexisting pathology.<sup>18</sup> Believing that Cannabis is a “soft” drug, free from health risks and whose free consumption should be allowed constitutes a grave mistake against public health, because it runs counter to the results of the contemporary research. The legalization of Cannabis for smoking, for supposedly “recreational” purposes is a matter of great controversy. In the current debate, even having been legalized its use for scientific and therapeutic research - so far have only been palliative-, we should consider that the right to have an opinion is correct, but does not assign truth about this opinion.

## Discussion

Purposes from one side and another regarding this problem are different, since they are due to different interests. But do not confuse

use of Cannabis (drug demand) with drug trafficking (offer and social and illegal availability of drugs). Such an argument requires a deep and careful analysis. The world literature supports its legislation to take advantage of the “medical use” that could have its synthetic derivatives used with proven utility - but only them, for the benefit of the collective health as a human right.<sup>19</sup> But the strongest argument for use ad libitum, is the incorrect interpretation of the approval that the Food and Drug Administration of USA (FDA) granted to the use of Cannabis and its synthetic derivatives for its legal prescription by doctors, but notice that, only with palliative purposes and on the occasion of certain severe cases of special disease, i.e. those diseases where higher or more convenient utility can be demonstrated, than the pharmacological resources currently used. But behold, many people expect this, for their individual toxic purposes, to free the possibility of smoking Cannabis freely at will. In case of accepting such “medical use”, it is recommended to society to be safe of addictive potential which can be produced during its use with doses controlled by non-toxic mechanisms or systems. To assume and respect the process of approval of drugs in the context of public health, not only for the drug and its derivatives, but for all drugs and controlled psychotropics, particularly those that have a high potential of abuse and dependence. But they are that, controlled not prohibited... Accordingly, it is striking that in pharmacies that sold them, different requirements to the recipes of the empowered physicians to prescribe them are requested.

This gives rise to thinking that there is a conceptual flaw in the regulation, or proper supervision is not applied. The result is that each pharmacy in the country does what it pleases... To this effect, it is important to point out regarding to the authorization of the use of synthetic compounds of the Cannabis, that it is not the same using the oil of a synthetic derivative of Cannabis, that smoking the grass as such. The decision relates to schools, councils, and schools of medical specialties and health authorities of the country, who shall grant or deny the change. But does not provide for young people looking for intoxication taking risks against their health, or who exhibit antisocial behavior, or like the risky fun in terms of: “Let’s see what happens”... The resolution of the Supreme Court of the country: “each person can decide and opt for what concerns to his life”, it is theoretically correct. But the desirable and convenient “right to decide on the healthy development of personality” outlined, requires becoming real, that each individual has: individuation, independence, autonomy, knowledge, will, self-criticism, judgment and effective use of such resources. Failing that, this right is not reachable, because it does not empower the person to gain the ability to decide wisely on health issues, even if it is his own. When you don’t know that you don’t know, ignorance will not prevent to express opinion; the simple right to speak does not confer veracity about what is said. In such conditions the debate must choose between toxicity and damage, or prevention and health.<sup>20</sup> In this delicate matter there is a trend to generalize improperly concepts and to simplify the conclusions, so it will be necessary to take an adequate control of the discussion by trained professional staff and ad hoc. Such legalization will have to consider the wide range of effects it can produce - some of them permanent-associated with its consumption at early ages, The marketing of this drug - surreptitious intention of many individuals and groups- should not be approved as the “free market” is not capable of preserving the public health. Young people must be protected preventing its access, since it is always better not to use it instead of exposing to it. It is required by now, to limit its dispensation, to educate people and to continue fighting illegality, without ambivalence. At the time, the popular interest focused on initiatives of state legalized smoked Cannabis use.

Today, once approved by the Mexican Congress and on the initiative of the President of Mexico, does not criminalize the cultivation of the plant will not be criminalized only if it is used for medical or scientific purposes. Its intention was to increase the amount allowed for personal possession and free consumption from 5 to 28 gr., which would serve, so he said it; a) to develop drugs based on marijuana and/or their active ingredients; (c) promote clinical research and c) to release the prisoners or individuals under process, by smaller amounts of the drug. This initiative, reiterated, “is directed to the prevention of addictions and the protection of our children and our youth”. Well, yes, but this gives way to consumption called “playful” instead of “toxic”. We will no longer have “little drug-users” but “strong users”. Such proposal causes cognitive dissonance, and reflects ignorance, confusion and ambivalence. How will we make prevention then?... unless adolescent population and adults are urged to refrain from consumption, as in the case of any harmful product because of its abuse and it’s self-managing.<sup>7</sup>

Clinical experience, supports the idea that people “don’t know what they want or why they do it”, since the vast majority of Cannabis users do not know why they consume it, and the reasons they put forward, full of subjectivity, show almost always ignorance and lack of reflection to the effect. Observed from the documented experience, global consumption of Cannabis in the adolescent population and young adults seems to obey to: a) ignorance about the origin of their desire, as a “necessity”; (b) the search of new and intense sensations, wanting to be obtained instantly after consumption; (c) to the achievement of an immediate gratification overrated, based on minimum effort; (d) to existential escapism facing difficulties posed by life and everyday problems; (e) to the fact of considering it “natural and therefore” not addictive (“between other bizarre motivations) and f) to the scarce perception held about the harm it causes to health and performance, where it should be noted the opinion of Damasio: when he says “the “myopia of youth that exists towards the future”... “While the unconscious is not made conscious, said Jung, the subconscious will direct life and it will be called destination”... Many consumers - ignorant of it - smoke it as part of a mechanism necessary to enter, belong and stay active in their peer group. In this condition it seems to underlie affective responses that promote their participation, either in an obedience or collaboration mode. The practice of medicine, more and more demanding with its standards in all specialties, tends to be based on scientific evidence. However, there are people who ignore and tolerate ambivalent consumption under the vague term of “personal consumption”. Cannabis produces addiction and other damages, therefore its derivatives must meet the same standards of oversight that apply to other medications. The doctors, who will decide the fate of such consumption and prescribe it, must adhere to the ethical and professional principles for the care of patients, under penalty of sanctions. In Mexico, the National Committee of Health Authorities and experts on the matter should monitor compliance with regulations in any clinical application that is intended to be given to this psychotropic, for the protection of all who consume it, whether this person is carrier or not of another mental disorder, and to society. Today, neither the permitted use of marijuana - as such-nor its medical use meets this standard. Until such products and devices have received approval from FDA and COFEPRIS for its marketing, its consumption should be rejected, and rehabilitate the patient with both disorders that make up the Dual Pathology. Individuals responsible for approving this type of consumption must be qualified to make decisions and be based on a careful review of the scientific data in both safety, efficiency, standardization and the formulation of required dosage to prevent the psychotropic to cause abuse and dependence,

among other consequences. Science is responsible, as well as society, to make everything that benefits community and, at the same time, from the humanist ethics, to support the production and dissemination of scientific knowledge for the well-being of all.

## Conclusion

For some years now and for the benefit of society, the global research - as Pedrero points out- has provided a great amount of information about: 1) the co-occurring addictive disorders with mental and personality ones. 2) it has increased knowledge on the mechanisms of dependence; 3) individual vulnerabilities and alterations of brain functioning; 4) behavioral and emotional manifestations associated; 5) the mechanisms involved in relapse of consumption, and 6) encouraging processes for treatment, recovery and social reintegration of patients with co-occurring addictive disorders. Also, data about the neurobiological basis of dependence have been updated, since the experimental research on animals. Many of the structures and functions involved in the addictive process are known now.<sup>21</sup> Human studies have proliferated and allow understanding the differences and similarities enabling a broad plan regarding mechanisms linked to dependency, by environmental interaction which can in the same way trigger or protect against it. Complex models have been formulated to explain the addictive phenomena from unit and global perspectives.

The result is that the theoretical proposals have advanced in its claim to explain and predict the mechanisms of dependence. Few areas of knowledge in medicine have provided such a large number and variety of theoretical approaches in a short period. However, the complexity of these disorders transcends the biological mechanisms to acquire the vision and the nature of social behavior. In the field of neuroimaging and its applications, in research on the structure and the functioning of the brain, both in its potential diagnosis, the brain has gone from being unknown to resolve, to be such a body that now you can see both during its normal and pathological processes, in full activity, without resorting to invasive methods, through the use of functional neuroimaging techniques.<sup>21</sup> Today, the brain is considered as an organ in permanent relation with the environment, which prints special character to the functions of the mind, extending this enriching biopsychosocial insight. Such a permanent process begins at birth and is maintained throughout life, although it supports critical periods during which it continually receives outside influence. Such influence is involved and even determines its transformations with critical implications on brain performance in the short, medium and long term. And although it has been documented that any rewarding behavior is potentially generator of dependence, it is the brain who eventually controls or overflows to the demands of each condition. Circumstantiality that continues clarifying carefully to its best knowledge.<sup>21</sup>

The brain will be more vulnerable the more poor it was its process of development, and this depends on matters as varied as the genetic load, the original and subsequent socialization processes, individual sensitivity to stress, learning of strategies to address it, etc. Because it is not enough for the proper handling of cases, knowing what substance is consumed, its neurobiological effects, the design of programs focused on the excessive consumption of a particular drug, or the creation of programs for care units in which patients should participate resignedly. Conversely, any program of treatment which aspires to rehabilitate and socially reintegrate patients must tend to individualization, as noted by WHO, being formulated with sufficient flexibility to recognize patients from one optics, which accepts in advance the different features between them, thus offering the

possibility of each of those affected under the guideline of the ad hoc program, to find what he needs to finally overcome dependence, in the framework of the control of its pathogenic duality. For this reason, it is crucial to assess broad criteria to persons to which professionals should attend, and the latter, monitor in their praxis for better training, so that they can increase the chances of providing benefits with the programming of each intervention. From perspective focused on the functioning of the brain, certain health-related disciplines can provide an intense and extensive experience in the treatment of neuropsychiatric pathologies of diverse etiologies. Knowledge of how brain alterations affect individuals in their daily lives, and the instruments which throughout time have been established place current simultaneous therapy -from pharmacology with psychotherapy-, in a privileged place that continues its development. A critical component to allow people access, stay and benefit from treatment programs is motivation. Today there are techniques in connection with the initial interview, which has shown its usefulness in different individuals, during certain phases and under some degree of intensity of their condition and handling to be received. The effectiveness of all interventions is beyond doubt at the present. However, it is also limited and less dependent than that observed in most of the other mental diseases.<sup>21</sup> The addictive process blocks the possibility of benefiting from these treatments. Quite possibly the existing alteration in brain function: 1) derived from its status as addictive; (2) from the imperative wish-necessity of consumption, and its searching conduct for the substance of consumption; (3) from his personality; and (4) from the interpretation of their own life experiences, among many other elements of simultaneous action, prevent certain patients to be able to put in place the mechanisms of change required. If this is the case, it would never be convenient or appropriate to ask the patient to try what cannot be achieved, as just wishing to quit the drug. The inclusion of cognitive rehabilitation techniques in treatment of people with co-occurring addictive disorder programs is a necessity of the first order, not only because with this other therapeutic interventions are favored, which is important for the overall management of the case, but also because better brain performance translates into better performance in daily life, precisely in those aspects that otherwise could encourage the return to consumption.

These programs willing to integrate the knowledge from complementary disciplines can be formulated from a psycho-educational perspective as other more focused on the neuropsychiatric and neuropsychological concepts.<sup>21</sup> With this new direction, contemporary research closes the gap that separated it from clinical practice for many years, to generate dramatic advances, the more crucial dimension of the current neuroscientific approach. The psychopharmacology that had always been important in the past as the central pivot of the intervention in patients with addictive disorders is today subject of review of the available scientific evidence, which brings to the table for discussion, just the selection of those drugs that have documented their usefulness in the treatment of Dual Pathology. Research of new drugs should not lose sight of the symptoms, but at the same time should focus on the finest knowledge of physiological components of dependence and its comorbidity with mental disorders. In consequence, it is required to have drugs that: 1) improve the performance of specific brain structures; 2) block the mechanisms of dependence; 3) promote neurogenesis and learning behaviors; 4) increase the overall functioning of the brain and allow greater superior control of intentional conduct oriented to adaptive goals.<sup>21</sup> A transcendent issue to point out is checking that a good part of the brain and metabolic alterations caused by the Dual Pathology are reversible, even from the earliest stages of withdrawal and symptom

control respectively, even though there are others depending on their type and extension, presenting a certain trend and level of chronicity, which will remain permanently or take many years to reverse. But in any case, most of the people who abandon their addiction can develop a full daily activity and relate appropriately with their social environment, with the support of a health care team coordinated in their functions by doctors, neuropsychologists and psychotherapists. In the end, once psychiatric symptoms are controlled, long-term management will fall in the latter.

As a consequence: 1) the update of educational-preventive measures is emphasized, 2) the demystification of the mental disorder, 3) prejudice against patients and their stigmatization, 4) disorders themselves - still observed as "moral failure" in certain sectors of society-, and 5) the promotion of clinical activities through appropriate and timely dissemination of accurate information, which aims to shed light on the doubts that prevail in these themes. Therefore, the professional responsibility of the health, clinical, and research staff requires a: 1) dispense with the old prejudices, 2) update knowledge, 3) provide best care practices, with greater degree of evidence to support the optimized brain development, 4) prevent contact with psychotropic substances, especially during periods of maximum vulnerability, 5) promote alternative conducts to substance use, 6) minimize the impact of coexisting addictive disorders, 7) enable early abandonment and recovery in the best possible conditions, and full incorporation of the subject to a life as healthy as possible. It is required, then, the full assumption of scientific knowledge, which leaves little room for speculation, prejudice and ambiguity. Standing out, the responsibility of each of those involved, and counseling of patients and families, with the priority goal of strengthening the essential therapeutic adherence. The explanation for human diseases, as well as the effects of any substance in the body require the participation of simultaneous elements, that as in the case of co morbid addictive disorders to mental disorders, the explanation cannot only be biological. It should consider the psychic aspects of the individual, which in turn are immersed in social phenomena.<sup>21-23</sup> We are still at the crossroads, as Bertrand Russell said: "much of the difficulties in the world, are due to the fact that ignorant people are completely safe and the intelligent ones are full of doubts". An effective and impartial political organization is therefore required. Will our social representatives be prepared to do this? The science to the service of policy or the policy to the service of science?.

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## Conflicts of interest

The authors declare that there is no conflicts of interest.

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