

# **Cannabis, Depression, Aggression, Violence and Suicide**

## **An extract from Cannabis: A General Survey of its Harmful Effects**

**Mary Brett updated July 2015**

The association between cannabis use and depression has received much less attention than that between cannabis use and psychosis. It may be that depressed people are less likely to seek treatment than those with psychosis (Degenhardt et al, 2001).

Thomas reported in a review article in 1993, that it was not possible to find scientific proof that cannabis causes a depression of clinical proportions. However he said there was a large body of clinical observations showing that short-lived dysphoric episodes can be provoked by the use of cannabis.

In Andreasson and Allbeck's study of 45,000 Swedish conscripts (1990) exploring relationships between cannabis, schizophrenia and suicide, they concluded that the cannabis indirectly increases the risk of suicide as a result of its ability to precipitate, exacerbate and cause depression and psychosis. In other words, the increasing frequency of suicides in large-scale users was thought to reflect the increased frequency of depression in cannabis abusers.

Weller (1989) compared abusers, users and non-users in outpatients. Fifty-five per cent of the abusers had clinical depression according to the DSM III. Rowe (1995) found an association with marijuana and depression in women. However both these studies have many confounding factors known to be responsible for causing depression e.g. use of alcohol and sedatives, family background with significantly higher levels of drug abuse, criminal activity and suicide. So a causal connection was impossible to establish.

Data from The US National longitudinal Alcohol Epidemiologic Survey indicated a diagnosis of cannabis use or dependency in the last year was associated with a 6.4 fold increased chance of receiving a diagnosis for major depression in that time (Grant 1995).

Green and Ritter in 2000, in a large drug use survey of men born between 1944 and 1954 found that marijuana users who use the drug to cope with problems are more depressed than those who do not use it to cope with problems.

More recently though, the questions of whether cannabis is a risk factor for causing depression, or depressed people use cannabis to self-medicate has been tackled by Bovasso in 2001. Based on data from 1980, he examined 1920 people in 1995.

"In participants with no baseline depressive symptoms, those with a diagnosis of cannabis abuse at baseline were four times more likely than those with no cannabis abuse diagnosis to have depressive symptoms at the follow-up assessment, after adjusting for age, gender, antisocial symptoms, and other baseline covariates. These symptoms mostly took the form of suicidal thoughts. Among the participants who had no diagnosis of cannabis abuse at baseline, depressive symptoms at baseline failed to significantly predict cannabis abuse at the follow-up assessment". This last finding was also reported by Kandel et al in 1984 and in 2000 by Kandel et al and McGee et al. In 2005, Hallfors et al also concluded that "Engaging in sex and drug behaviours places adolescents, and especially girls, at risk for future depression".

JS Brook and others in 2001 published a longitudinal study on over 2000 Colombian adolescents. A clear connection was found between marijuana use and raised levels of anxiety and depression. A prediction can be made of later distress in adolescence if marijuana is used at an early age.

DW Brook and others in 2002 in another longitudinal study found that early marijuana use in childhood and adolescence increased the risk of major depression by 17%. Again the warnings were given of the implications for psychiatric problems later in life because of early use.

Patton and others (2002) followed the progress of 1600 young people, male and female from the age of 14/15 in 1997/8, starting by and large before they had any mental problems or had used drugs. He studied them at 14/15 and again at 21/22. Daily use of cannabis in young women but not men, was linked with an increased risk of between 4 and 5 times in the odds of reporting a state of depression

after adjustment for co-founding factors. Weekly use was associated with around a twofold greater risk for depression and the prevalence of the condition increased with higher usage of the drug. They also showed that depression in teenagers did not give rise to an increased cannabis use in early adulthood.

Chen and others (2002) on re-analysing the US National Co-morbidity Survey (NCS), found that those dependent on cannabis at some time in their lives was associated with a 3.4 times greater risk of major depression. And also in 2002 in Australian adolescents a moderate connection was discovered between cannabis use and depression after taking account of other drug use, age and gender. The correlation was most marked in those who had used once or more in the last month (Rey et al, 2002).

2002, Vlahov D et al found that New Yorkers who increased their use of marijuana , tobacco or alcohol after September 11<sup>th</sup> had increased chances of developing Post Traumatic Symptoms. Marijuana increased both PTS symptoms and depression more than the other substances.

Degenhardt et al (2003) reviewed the literature on this subject and produced the following results. “There was a modest association between heavy or problematic cannabis use and depression in cohort studies and well-designed cross-sectional studies in the general population. Little evidence was found for an association between depression and infrequent cannabis use. A number of studies found a modest association between early-onset, regular cannabis use and later depression, which persisted after controlling for potential confounding variables. There was little evidence of an increased risk of later cannabis use among people with depression and hence little support for the self-medication hypothesis. There have been a limited number of studies that have controlled for potential confounding variables in the association between heavy cannabis use and depression. These have found that the risk is much reduced by statistical control but a modest relationship remains”.

Another review was conducted in 2004 by Rey and others. Their results were very similar. “There is growing evidence that early and regular marijuana use is associated with later increases in depression, suicidal behaviour and psychotic illness, and may bring forward the onset of schizophrenia. Most of the recent data reject the view that marijuana is used to self-medicate psychotic or depressive symptoms”.

In a study of 600 same-sex twins, only one of whom was cannabis dependent, it was found that the risk of major depressive disorder was greater in the cannabis dependent twin of fraternal twins; this was not borne out in identical twins (Lynskey et al, 2004).

Other papers indicating a significant association between cannabis use and depressive orders include: Kelder et al (2000), Winokur et al (1998), Troisi et al (1998) and Miller et al (1996).

It is very difficult to determine whether cannabis is associated with violence due to the use of cannabis, withdrawal from the drug, a personality predisposition to violence or indeed because of the illegality. Disputes often arise between drug dealers, users and peers (Arsenault et al 2000). Professor Heather Ashton says in her 1999 review article, ‘Adverse effects of cannabis and cannabinoids’ that “cannabis in most recreational settings decreases aggressive feelings in humans and increases sociability. However, occasional predisposed individuals, especially if under stress, become aggressive after taking cannabis. Violent behaviour may also be associated with acute paranoid or manic psychosis induced by cannabis intoxication”.

Dyer (1996) wrote in the BMJ that, “Drug or alcohol misuse combined with a mental disorder could treble or quadruple the risk of violence”.

Two studies by Kouri and others (1999 and 2002) investigated aggression during withdrawal from cannabis. The Harvard Study in 1999 compared 17 long-term heavy users with 20 infrequent or former smokers. All abstained from the use of cannabis and all other drugs for the duration of the experiment. They were not told that they were being monitored for aggression - temperature and heart rates were measured, so data were not gathered by “self-reporting”. The heavy users showed much more aggression than the controls especially in the first week of abstinence. By day 28 this behaviour had faded.

In the 2002 study they monitored 30 current users and 30 controls (16 former heavy users and 14 light users). There was no difference between the groups to start with except in the ability to concentrate which was worse in the current users. The subjects reported an increase in irritability, anxiety, tension

and physical symptoms peaking 7 to 10 days after abstinence. Thus from the 2 studies it can be argued that “aggressive responses of current cannabis users are due to marijuana withdrawal rather than a mere history of marijuana use”.

Fergusson and others during The Christchurch Cohort Study in 1997 when the subjects were aged 16, assessed them for cannabis and violence (assault, fighting, weapon use, threats of violence against another). There was a dose-response relationship with higher cannabis use and an increasing number of violent offences which persisted after controlling for other drug use and peer criminal behaviour, suggesting that deviant peer affiliations are not responsible. In a follow-up at the age of 21 (2002), they found the same association. The link was especially strong in those who had started using early, between 14 and 15 and were regular users (weekly or monthly). An increased frequency in incidents of property or violent crime, depression, suicidal ideation and suicide attempts was observed. The authors pointed out that there was a possibility that pre-existing psychosocial problems may have encouraged cannabis use rather than the other way around so caution must be applied and the results may not indicate a causal explanation for cannabis.

Spunt et al (1994) interviewed 268 people in prison for murder in New York State in 1984. 73 had been under the influence of cannabis at the time and 18 said that the use of cannabis was linked to their crime. When asked, 4 of them said it made them violent and aggressive, one said that when he was high he lost control and another that he doubted he would have done it had he not been under its influence. Four were of the opinion that it lowered their inhibitions and 2 said it made them paranoid. Some who were under the influence of both cannabis and alcohol at the time said the combined effect made them lose self-control.

Twelve cases of aggravated violent crime were looked at in Geneva between 1996 and 2000 (Niveau and Dang, 2003). All the perpetrators were under the influence of only cannabis at the time. Others were discarded because of poly-drug use. Five were previously known to have a personality disorder and three others had psychiatric disorders. All twelve suffered from severe negative effects of cannabis use. Four had an acute psychotic condition, one a relapse into or exacerbation of chronic paranoid psychosis, another 3 had intense anxiety and 3 delirium. The remaining one had a “mood” disorder. There is a growing interest in “dual diagnosis”, ie cannabis use is included as one of the disorders. There is also growing concern about the combination of alcohol and cannabis.

Serious problems of fighting with weapons, window breaking and theft in males and aggressive acts, violent quarrels with teachers, openly cursing or being sent to see the school head in females were all predictors for early cannabis initiation (Pederson et al 2001). Hall JA and others (2003) said that users of cannabis at an early age are at greatest risk of delinquency and violence. They are also most likely to engage in such behaviours before beginning to use cannabis.

Arsenault and others in their “Dunedin Study 2000”, discovered that alcohol dependent individuals were almost twice, marijuana-dependents almost 4 times, and those suffering from schizophrenia spectrum disorder, two and a half times more likely than controls to be violent (Arsenault et al, 2002).

2001 Friedman et al investigated violent behaviour as related to use of marijuana and other drugs. A sample (number 612) of African-American inner city young adults was studied. Unexpectedly, greater frequency of marijuana use was found to be associated with greater likelihood to commit weapons offences. This association was not found with any other drug except alcohol. There was also an association between marijuana and attempted homicide/reckless endangerment offences.

Friedman et al in 2003 found that, for a conventional non-delinquent sub-group, a higher degree of significant relationship between degree of marijuana use and degree of violence occurred, compared to the degree of this type of relationship than was found for either cocaine/crack use, amphetamine use, or tranquilliser/sedative use. In a group that is high on delinquent behaviour, the effect of marijuana was less. Thus, this special disinhibition effect was found only for marijuana and not for the other drugs.

A more recent investigation among 5,500 Dutch adolescents between 12 and 16, found that criminality and aggression increased with increasing use of cannabis. No link was discovered between internalising problems, withdrawal and behaviour. Social factors, regular tobacco smoking and alcohol

use were all taken into account. Significant associations were only found in those who had used the drug recently (Monshouwer, 2006)

A series of surveys by PRIDE (Parent Resources and Information on Drug Education USA) and ONDCP (Office of National Drug Control Policies) in 2006 added more evidence of the link between cannabis use and violence.

Of those students who reported carrying a gun to school during the 2005/6 school year, 63.9% had also used marijuana, 39.9% cocaine and 36.8% crystal meth in the past year. (PRIDE Surveys (2006)

Questionnaire report for grades 6-12: 2006 National Summary 184).

Of those students who reported hurting others with a weapon at school, 68.4% had used marijuana, 48.3% cocaine and 44.1% crystal meth in the past year. (PRIDE surveys 2006 etc 197)

The incidences of youth physically attacking others, stealing, and destroying property increased in proportion to the number of days marijuana was smoked in the past year. Marijuana users were twice as likely as non-users to report they disobeyed school rules. (Office of National Drug Control Policy 2006 *Marijuana Myths and Facts: The Truth Behind 10 Popular Misperceptions* 10).

Of those students who reported threatening someone with a knife, gun or club, or threatening to hit, slap or kick someone in the school year 2005/6, 27% had used marijuana, 7.8% cocaine and 6.2% crystal meth in the past year (PRIDE surveys (2006) etc 194).

During the school year 2005/6, 39.6% of those in trouble with the police used marijuana, 12.2% cocaine and 9% crystal meth in the past year (PRIDE surveys (2006) etc 195).

PRIDE surveys are available: <http://www.pridesurveys.com/customercenter/us05ns.pdf>.

In a Welsh study of 740 identical and non-identical twins, it was found that, while the environment played a part in the development of cannabis use disorder in those with conduct disorder, genetics had a significant influence. Therefore the absence/presence of a conduct disorder in a twin pair is a good predictor of cannabis use. The findings suggest that cannabis use and violence to some extent co-occur due to personality tendencies (Miles et al, 2002).

Other researchers to find a connection between cannabis and violent behaviour are: Resnick et al, 1997, Dornbusch et al, 1999, Friedman, 1996 and White, 1998.

A 1995 (Fugelstad et al) Swedish study looked at suicides. In a study of 53 people who jumped from a great height, 11% were under the influence of cannabis, a disproportionate number. They calculated that a cannabis smoker is 18.7 times more likely to take his own life by jumping than a non-smoker. The number of cannabis-related suicides, in comparison with suicides related to the use of other drugs, users of heroin, amphetamines or alcohol, was much higher and none of them jumped from high places or committed murder before taking their own lives. No homicides were carried out by the users of other drugs who committed suicide.

Beautrais et al (1999) found only a very limited independent association between cannabis and suicide but indicated the indirect link by way of psychosis and depression, both of which can increase suicide rates.

2001 Friedman et al investigated violent behaviour as related to use of marijuana and other drugs. A sample (number 612) of African-American inner city young adults was studied. Unexpectedly, greater frequency of marijuana use was found to be associated with greater likelihood to commit weapons offences. This association was not found with any other drug except alcohol. There was also an association between marijuana and attempted homicide/reckless endangerment offences.

The Australian News on November 25<sup>th</sup> 2002 reported a "Marijuana suicide epidemic" among the Aborigines in The Northern territories. In one community of 650 people, 30 suicide attempts related to cannabis were made in one year, in one month period, 3 succeeded. It appeared that they were buying marijuana, mixing it with alcohol and becoming paranoid.

Research was carried out in the Caribbean island of Trinidad where there is an established use of cannabis and high suicide rates. "Depression and psychotic experiences were common findings in adolescent cannabis users with a significant preponderance of depressive experiences. Our findings suggest that there is a convincing relationship between suicidal behaviour and cannabis use" (Maharajh and Konings, 2005).

Heavy cannabis use and depression were linked in a study on 3 Aboriginal communities in Arnhem Land in the Northern Territory in May 2008 by Lee and others. "After adjusting for other substance use (tobacco, alcohol and lifetime petrol sniffing) age and sex, heavy cannabis users were 4 times more likely than the remainder of the sample (106 individuals) to report severe depressive symptoms".

There have been numerous reports in the press linking cannabis with violent incidents and suicide. These are a few examples:

A wealthy 52 year-old music producer was attacked in her home by a 20 year-old family friend made psychotic by the drug. She had to have 11 operations to rebuild her face. At the time doctors warned she would likely die (The Times 5/02/06). A judge attacked the use of cannabis after a 25 year-old professional golfer with a history of cannabis smoking killed his grandmother and aunt in a frenzied attack (Daily Mail 25/11/03). A coroner blamed cannabis for 2 deaths after a long-running feud over a hedge. A 52 year-old man grew his own supplies in his attic and had become addicted after smoking between 5 and 10 cannabis cigarettes a day. He shot his 66 year-old neighbour then committed suicide a week later in prison (Daily Mail 16/01/04). A teenager stabbed himself to death in the chest with scissors in front of his helpless father, he thought he was invincible. He had previously threatened his sister and girlfriend (Daily Mail 28/02/02). Then there was the well-publicised case of Luke Mitchell, 16 who slashed and killed his 14 year-old girl friend Jodi Jones in Scotland. He told his psychiatrist he smoked 600 joints a week (Daily Mail 12/02/05).

Britain's most senior coroner, Hamish Turner, issued warnings in various papers in November 2003 that hundreds of young people are dying because of prolonged use of cannabis. He claimed that, over the last year, of the 100 deaths he had dealt with, 10% had a significant link to the drug (Daily Mail 3/11/03).

A 22 year-old nurse smoked cannabis for 5 years, became very depressed and hung himself in his bedroom (Daily Mail 12/06/05). A student hung himself after developing a mental illness induced by the use of cannabis. He left a suicide note which read, "Cannabis has ruined my life" (The Times 9/09/03). James Taylor hanged himself in his Torquay flat after smoking cannabis since he was 15. He suffered mental health problems and depression (Daily Mail 3/11/03).

I recently met a nurse from a GP Practice. She said, "If only people could come in and look at the records. The number of our young patients they would see who have as their priority condition: "Marijuana-induced depression, Marijuana-induced psychosis or Marijuana-induced schizophrenia, would really bring the problem home to them. They would not believe it. This is a huge problem".

"Teens Drugs and Violence", a special report from the Office of National Drug Control Policy in the USA, in June 2007 concluded that "Early use of marijuana – the drug most widely used by teens – is a warning sign for later gang involvement" and "Teens who participate in gangs are more likely to be involved in violent acts and drug use". "Teens who report current and regular marijuana use are 9 times more likely than non-users to experiment with other illegal drugs or alcohol, and five times more likely to steal....Children who use marijuana are nearly four times more likely to join gangs. Being a member of a gang dramatically increases a teen's risk of being a victim of violence, not just a perpetrator".

A possible mechanism for cannabis-induced violence was found in a paper by Howard and Menkes in October 2007. Five habitual cannabis users were given a reefer containing 11mg of THC. An electrocortical measure of affective impulsivity, Go/No Go contingent negative variation was carried out during and after smoking. Slow brain potentials developed normally in both Go/No Go conditions before and during smoking but were severely disrupted 20 to 30 minutes later – peak intoxication! (The effects were said to resemble those occurring in patients with lateral prefrontal cortex lesions). Larger scale studies were called for.

In 2009 Dr Gabriella Gobbi found that teenage cannabis users have decreased serotonin transmission leading to mood disorders, and increased norepinephrine transmission which leads to greater long-term susceptibility to stress. She said, "Our study is one of the first to focus on the neurobiological mechanisms at the root of this influence of cannabis on depression and anxiety in adolescents." It is also the first to demonstrate that cannabis causes more serious damage during adolescence than adulthood.

2010 Fazel and others conducted a study into bipolar disorder and violent crime. Participants were: individuals with 2 or more discharge diagnoses of bipolar disorder (n = 3743), general population controls (n = 37,429) and unaffected full siblings of individuals with bipolar disorder (n = 4059). 314 individuals with bipolar disorder (8.4%) committed violent crime compared to 1312 general population controls (3.5%). The risk was mostly confined to patients with substance abuse co-morbidity, and minimal in patients without substance use comorbidity. This was further attenuated when the unaffected full siblings were used as controls. They concluded, 'Although current guidelines for the management of individuals with bipolar disorder do not recommend routine risk assessment for violence, this assertion may have to be reviewed in patients with comorbid substance abuse'.

2010 de Graaf et al looked at early cannabis use and depression. They concluded: The overall association was modest (controlled for sex and age), was statistically robust in 5 countries, and showed no sex difference. The association did not change appreciably with statistical adjustment for mental health problems, except for childhood conduct problems, which reduced the association to non significance. This study did not allow differentiation of levels of cannabis use; this issue deserves consideration in future research.

2011 Otten et al found that cannabis smoking increases the risk of depression in the case of genetic vulnerability. Data were collected over 5 years from 428 families and their 2 adolescent children in Holland. In young people with a variant of the gene 5-HTT cannabis use led to an increase in depressive symptoms. The effect was still 'robust' even accounting for alcohol use, smoking, upbringing, socio-economic status or personality.

Daily Mail Tuesday September 28<sup>th</sup> 2010 reported the case of a public schoolboy, hooked on cannabis, who stabbed his best friend 13 times and left him for dead. Harry Schick, 17, was locked up for 9 years. The boy, Gavin Doyle, was able to dial 999 and was rescued from woods by a helicopter with heat-seeking equipment. He is still experiencing problems from wounds to his hands. "Schick had no history of violence though his psychiatric report said that his heavy use of cannabis had led him to become distanced from reality".

2012 August Fergusson et al looked at The Christchurch Health and Development Study (1265 NZ children born in 1977 and studied at 4 months, 1 year, then yearly till age of 16, then at 18, 21, 25 and 30). These research findings were presented at The Second national Cannabis Conference in Brisbane on September 20<sup>th</sup> 2012. Not only did cannabis use precipitate suicidal thoughts but the higher the frequency of regular use, the faster susceptible individuals became suicidal. If all males used cannabis less frequently than several times/week, suicidal ideation would be experienced by 15% of 18 year olds, 24% of 21 year olds and 30% of 30m year olds. If they had all started using cannabis several times a week from the age of 17, then all males would show an increase of 24% of 18s and 31% for 21s.

2012 November Sheehan and others looked at gender differences in the presence of drugs in violent deaths. Conclusions: Suicide and homicide decedents are characterized by varying patterns of licit and illicit drug use that differ by gender. Drugs associated with homicides (marijuana, cocaine and amphetamines) are stronger among males, while drugs associated with suicide are stronger among females (antidepressants and opiates). Taking these differences into consideration may allow for targeted interventions to reduce violent deaths.

2013 Smith et al reported that laboratory-based increases in aggression due to marijuana withdrawal extend to the general population of marijuana users who have a previous history of aggression.

2013 Wong and others looked at clinical implications of substance use on suicidality among youths. Data from The Youth Risk Behaviour Survey from 2001 to 2009 were used to analyse the correlation between lifetime use of 10 common substances of abuse – heroin, alcohol, cocaine, ecstasy, hallucinogens, methamphetamines, steroids, tobacco, inhalants, marijuana. The study controlled for multiple co-founders. The key findings concluded that a history of all substance abuse is a strong and independent risk factor for adolescent suicide ideation, and plans, and attempts – even after controlling for eg depression, eating disorders, interpersonal violence etc. 4.1% of adolescents who reported at least once /lifetime marijuana use made a suicide attempt that required medical attention compared with 0.89% who reported never using marijuana. The greater the number of substances used, the more attempts were made.

2013 Brook et al looked at the relationship of marijuana use from adolescence to adulthood and the use of weapons including guns. African Americans and Puerto Ricans (838). There was a higher probability of engagement in violence (shooting or hitting with a weapon) among those with increasing marijuana use, moderate use and the quitter group than those with no use.

2014 SAMHSA ( Substance Abuse and Mental Health Services Administration) in the USA 2012 Survey of Drug Use and Health (70,000 individuals age 12 or over) found that adults using illicit drugs are significantly more likely to contemplate suicide than the general adult population. 3.9% of US adults in a given year (9m) have serious thoughts of suicide . This rises to 9.4% of those who use illicit drugs. This varied with the type of drug used. Sedatives produced a 21% rise, opioid pain relievers 13% and marijuana 10%.

2014 Zang and Wu found that ideation of suicide and substance abuse among adolescents and young people increased the risk of illicit drug use. 3342 people were tested on 4 occasions from 1995 to 2009. Their conclusion, 'Use of cigarette or alcohol increased risk of suicidal ideation, while suicidal ideation was not associated with cigarette or alcohol use. Reversely, drug use (marijuana and other drugs) did not increase risk of suicidal ideation, but suicidal ideation increased risk of illicit drug use'.

2001 Friedman et al investigated violent behaviour as related to use of marijuana and other drugs. A sample (number 612) of African-American inner city young adults was studied. Unexpectedly, greater frequency of marijuana use was found to be associated with greater likelihood to commit weapons offences. This association was not found with any other drug except alcohol. There was also an association between marijuana and attempted homicide/reckless endangerment offences.

2014 Cairns et al studied risk and protective factors for depression in a systematic review and meta-analysis. 113 publications were identified (longitudinal studies of 12-18 year olds) which met the criteria. They concluded that future health education campaigns should aim to reduce substance abuse (alcohol, tobacco, cannabis, other illicit drugs, and polydrug use); dieting; other negative coping strategies; and to promote healthy weight; diet and sleep patterns.

2015 Jan. Ansell et al found hostility and impulsivity among marijuana users in daily life. Forty three participants with no substance dependence reported on their alcohol consumption, tobacco use, recreational marijuana use, impulsivity, and interpersonal hostility in others over 14 days. Marijuana use was associated with increased impulsivity on the same day and the following day relative to days when marijuana was not used, independent of alcohol use. Marijuana was also associated with increased hostile behaviors and perceptions of hostility in others on the same day when compared to days when marijuana was not used. These effects were independent of frequency of marijuana use or alcohol use. There were no significant effects of alcohol consumption on impulsivity or interpersonal hostility.

**CONCLUSIONS: Marijuana use is associated with changes in impulse control and hostility in daily life. This may be one route by which deleterious effects of marijuana are observed for mental health and psychosocial functioning. Given the increasing prevalence of recreational marijuana use and the potential legalization in some states, further research on the potential consequences of marijuana use in young adults' day-to-day life is warranted.**

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