CANADIAN STUDENTS FOR SENSIBLE DRUG POLICY

Sensible Cannabis Education

A Toolkit for Educating Youth

Version 1.1

Canadian Students for Sensible Drug Policy (CSSDP) is a grassroots network of youth and students who are concerned about the negative impact our drug policies have on individuals and communities. We consider drug use a health and human rights issue rather than a criminal-legal issue. We advocate for evidence-based responses to reduce and prevent the harms associated with drug use and drug criminalization.

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INTRODUCTION

Aligning with CSSDP's mandate to support drug education efforts, and building upon youth consultations on cannabis legalization conducted in Canada, this toolkit responds to calls for the development of realistic and evidence-based cannabis education for youth. Created for educators, as well as parents, this resource aims to support adults in having informed and non-judgmental conversations with young people about cannabis.

According to the Canadian Cannabis Survey, before legalization 19.8%[1] of youth age 15-17 used cannabis, while the corresponding post-legalization estimate from the third quarter release of the CCS (2019) was 10.4%[2]. While it is too soon to make concrete observations about the impact of legalization on youth use, it is notable that reported consumption has fallen across the first year of legalization. However, youth estimates that capture a wider range of young people age 15-25 continue to suggest a consumption rate 2 or 3 times higher than adults age 25 and older.[3,4] Given that cannabis was the most popular illegal drug consumed by young people in Canada, as well as Canada's decision to legalize and regulate non-medical cannabis, the continued development of cannabis education for youth is of critical importance. The legalization of cannabis in Canada is an opportunity to revise our approach to cannabis education for youth.

In September 2016, CSSDP held a youth roundtable on cannabis legalization and regulation titled, "Youth Speak: Cannabis Policy in the 21st Century." Attended by diverse young people in Toronto, Ontario, CSSDP gathered input for a youth-focused submission to the Task Force on Marijuana Legalization and Regulation. A consensus emerged among attendees that there is a lack of evidence-based cannabis education in their schools, families, communities, and online. Youth highlighted the need for education that prioritizes the development of youth's "cannabis literacy" by including evidence-based assessments of risk and harm reduction principles. Cannabis literacy refers to the knowledge and skills required to make informed choices around cannabis use.[5] Youth described the need for drug conversations and education to start sooner, with age-appropriate content, and highlighted the importance of creating content with the input of young people, including those who use cannabis. Building upon the roundtable, this toolkit was created as a first step towards sensible youth cannabis education. Throughout this toolkit, the term "youth" and "young people" is used to refer to those between the ages of 14-25, unless otherwise stated.

Generally, the central purposes of drug education are to provide accurate information and awareness of resources, develop decision making skills and health literacy, reduce risks of consumption, and support increasing an individual's risk competency.[6] However, this toolkit goes beyond these mandates.

While there is no silver bullet approach for talking about cannabis with youth, this toolkit provides guiding principles and a curriculum for youth cannabis education

The toolkit is broken into two parts. The first section highlights ten guiding principles for conducting cannabis education with young people. In this section, the concepts and values important to the delivery and implementation of cannabis education for youth are discussed. Although outlined in the context of cannabis, these principles are also applicable to education on other substances. The second section focuses on content that merits inclusion in a comprehensive cannabis education curriculum for young people, including evidence-based information about cannabis, its uses and effects, as well as harm reduction strategies. This section also addresses many common claims made about youth cannabis use, such as the impacts on the developing brain.

The toolkit was developed in consultation with CSSDP's Board of Directors, national chapters, and an external Youth Content Review Team to ensure alignment with the concerns of young people. Authors drew extensively from the available scientific literature, as well as relevant resources from the drug policy community including Students for Sensible Drug Policy's "Just Say Know" curriculum, the Canadian Centre on Substance Use and Addiction's "Clearing the Smoke" series, the Canadian Research Initiative in Substance Misuse (CRISM)'s "Lower Risk Cannabis Use Guidelines," HereToHelp BC, and more. Further, CSSDP has hosted workshops across Canada to talk with diverse groups of youth and people who work with youth about this toolkit – its messaging, its principles, and its scope. We have also presented this work to a diverse range of key stakeholders, including the federal government, the Senate of Canada, and as part of a side event with other youth groups at the UN's Commission on Narcotic Drugs.

In this latest edition of the toolkit, we've updated the scientific literature and best practices since the toolkit's original publication in 2018. We have integrated the feedback we received from our workshops with youth and individuals who work with young people and are excited to continue to build out this work, with the goal of promoting sensible, evidence-informed dialogue. Over two years after legalization, education efforts must continue to be updated to not only meet the needs of a diverse youth population under a new framework, but also keep up with a quickly changing regulatory and research landscape.

CSSDP is a proud recipient of the federal government's Substance Use and Addiction Program grant in 2020, which will provide two-years of funding to advance sensible cannabis education for young people. These funds will allow us to facilitate a national dialogue with young people age 17-25 about cannabis both in person and online, with the inclusion of peer leaders to ensure youth perspectives and approaches are centred and uplifted. We are also working to increase the reach and distribution of this toolkit, which is available both online and in print in 5 languages (English, French, Mandarin, Punjabi, and Spanish).

We know there is no single agreed upon model to cannabis education and that context matters. Even if a particular approach is considered exemplary in one context, it should always be adapted to local situations, rather than simply replicated. As such, this toolkit remains a starting point for the development of educational approaches, which will allow for flexibility, and provide insight into how youth cannabis education can be operationalized in practice, as well as further refined and improved.

SECTION 1:
CSSDP'S GUIDING PRINCIPLES FOR CANNABIS EDUCATION

The following ten guiding principles are meant to provide a framework of core concepts and values to support the development of youth cannabis education. They are intended to guide decisions related to cannabis education and conversation practices rather than act as a set of detailed instructions or an action plan for implementing a drug education curriculum. The guiding principles underscore a broad set of concepts that, collectively, can guide the design and implementation of youth cannabis education.

Given the diversity of young people, these principles can be adapted and implemented in different ways to best serve the given context. While the following principles are not listed in order of importance, they are mutually reinforcing, overlap in some instances, and reflect the current state of research in the promotion of cannabis literacy, health, and wellbeing among youth.

1. ***Education grounded in evidence-based information***
2. ***Non-judgmental, open dialogue that uses interactive approaches***
3. ***Meaningful inclusion***
4. ***Delivery by a trained facilitator or peer***
5. ***Starting education earlier, with age-appropriate content***
6. ***Supporting open parent-child communication***
7. ***Inclusion of harm reduction***
8. ***Education tailored to the specific context***
9. ***Ongoing education available to youth***
10. ***Attention to overlapping issues of racism, social justice, and stigma***

1.1 EDUCATION GROUNDED IN EVIDENCE-BASED INFORMATION

- Fear-based and abstinence-based approaches do not resonate with youth
- Environmental factors can increase or decrease the likelihood of use and should be accounted for in approaches to education
- Go beyond just facts by including skills development in cannabis education

Youth should be given easy access to evidence-based information around cannabis. Since the 1960s, the dominant practice in drug education has been to instill fear around drug use by focusing on, and often exaggerating, the negative consequences of use. Authoritarian and fear-based approaches to drug education can alienate young people and undermine the credibility of education efforts.[7] This includes, for example, popular programs such as Drug Abuse Resistance Education (D.A.R.E), which have been shown to be ineffective.[8,9] Moreover, many popular drug programs of the past and present rely on an abstinence-based approach, particularly school-based prevention programs. Abstinence-based approaches are centred on the idea that avoiding drug use is the only acceptable option, and often relies on the stigmatization of drug use and users.[10,12,13] Although there are many reasons why youth may use cannabis, cannabis education has traditionally framed use in very narrow ways and ignored the diverse spectrum of use patterns between "abstinent" and "problematic." Additionally, much available education does not recognize that youth often obtain their information online, and as such, many older programs have ignored the digital context of how our generation obtain, explore, and generate information about drugs and drug use.

In addition to the ineffectiveness of the predominantly used fear- and abstinence-based approach in school-based programs,[14] barriers to meaningful drug education for youth also include the absence of youth input and perspectives in curriculum development. Young people have a right to access accurate and non-judgmental evidence-based health information. Strategies that aim to engage in honest dialogue and reduce dangerous behaviours associated with cannabis use have had some promising results.

Abstinence-based approaches are centred on the idea that avoiding drug use is the only acceptable option, and often relies on the stigmatization of drug use and users

Education should also be grounded in considerations of risk and protective factors around drug use. Risk factors are considerations of an individual or their environment which may enhance the likelihood of harmful cannabis use (e.g., weak family bonds, chaotic family environment, disengagement with school, trauma, poor economic conditions), and protective factors are those which reduce the risk of developing problematic use (e.g., strong parental monitoring, strong community cohesiveness, social skills development).[15] Consideration of these protective and risk factors across domains of youth's lives – including individual, school, community, and family – can lead to positive outcomes, including helping youth build resiliency and healthy coping skills.[16]

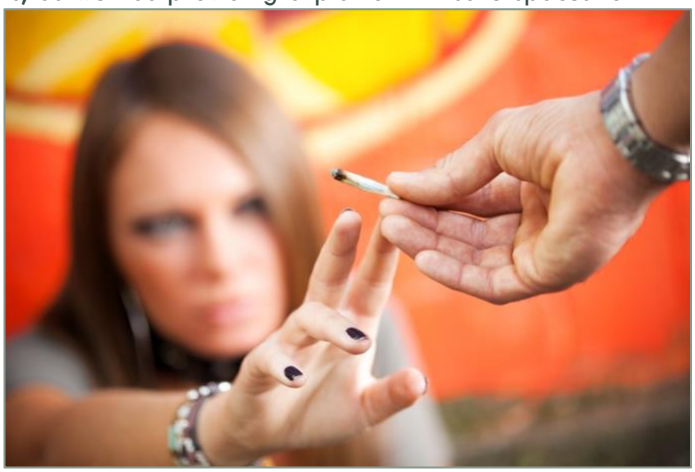
Young people have a right to access accurate and non-judgmental evidence-based health information

Further, when discussing factual information about the effects of cannabis use,[17] it should be kept in mind that providing facts without addressing wider social contexts of youth drug use have also not been found to be effective educational methods in and of themselves.[18,19] Taking an evidence-based approach does not suggest that education should simply provide "drug facts" to youth. Evidence shows that skill-based programs are more effective than programs that focus exclusively on knowledge, attitudes, and intentions.[20,21] Ultimately, effective cannabis education relies on a combination of elements – many which are not successful in isolation – and incorporating a greater number of these components has had more success.[22,23,24] Therefore, an evidence-based approach would also be interactive and multifaceted by incorporating aspects such as personal development, general decision making skills, how to manage stress, and harm reduction.[25,26,27] There is also support for programs focusing on social influence, the development of life skills, resistance skills, and normative education, as these are more successful than other approaches.[28,29] It is important to note that this does not suggest a "kitchen sink" approach, where education should add as many kinds of information and skills as possible. The best approach depends on context; age, cultural considerations, and realities of youth's experiences are all factors in deciding which approach is right. Apart from the actual delivery method used, cannabis education should be created by engaging both young people who are using cannabis and those who are not, taking advantage of the full breadth of information and insight youth have to offer.

1.2 NON-JUDGMENTAL, OPEN DIALOGUE THAT USES INTERACTIVE APPROACHES

- Youth do not have many opportunities to have balanced discussions about cannabis that would shed light on their choices and experiences related to cannabis use
- Listening and asking open-ended questions without judgment, and not devaluing youth's experiences is important to building rapport and fostering open dialogue
- Education efforts around cannabis should prioritize interactive approaches that provide contact and communication opportunities for the exchange of ideas among participants

Adolescence is a critical period of development for young people in many ways, as well as a key age for talking about substance use. Conversations around substance use can start before adolescence, but are especially important at this time. Young people often do not have access to avenues that allow for open and balanced discussions about cannabis use,[30] including a more rigorous understanding of the reasons for use, risks, and how to minimize those risks. Providing young people with the tools to help them articulate their thoughts about cannabis, as well as providing a platform in safe spaces to explore and navigate questions or challenges they may be facing without judgement, can lead to meaningful discussions.



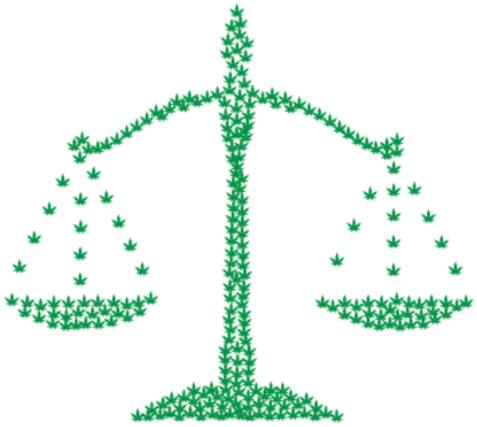
To address these concerns around how to approach cannabis education, promoting open dialogue without judgment is important. As such, starting with a conversation around the common perceptions of people who use cannabis and how they are often depicted in the media can help to break down barriers and open dialogue about personal experiences with cannabis. This can then elicit and allow youth to highlight aspects of cannabis use that they may be curious about. Effective ways to promote open dialogue include asking open-ended questions and using language that is accessible and straightforward. Studies that have assessed the use of innovative resources (such as films) to encourage open and non-judgmental dialogue and decision making on cannabis use have shown promising results.[31] It is imperative to acknowledge that some youth will choose to use cannabis regardless of the resources provided. Therefore, including a conversation about the differences between appropriate and problematic use is valuable.

It is imperative to acknowledge that some youth will choose to use cannabis regardless of the resources provided

It is crucial to be respectful and non-assuming about young people's experiences, feelings, and curiosity about cannabis use in general, including its most mundane or stigmatizing aspects. Engaging in open dialogue typically requires building a positive rapport with youth. For example, asking for honesty and then expressing anger when youth talk about their cannabis use will not foster an open conversation. It may take time to build a rapport of honest dialogue, but it is important to note that using cannabis once or occasionally holds a relatively low harm and risk profile, and most of the literature on the risks of youth cannabis use pertains to heavy or daily cannabis use.

Further, research and general discussions around youth cannabis use often dismiss claims of medical use. Youth who discuss medicating with cannabis (self-medicating or otherwise) should be taken seriously and listened to if they are using cannabis to deal with specific symptoms or ailments of a condition. If appropriate, encouraging a discussion with a healthcare practitioner (HCP) who is open to having a non-judgmental conversation around cannabis use can be helpful. If a young person is using cannabis for a legitimate medical condition, there are a variety of options a HCP may be interested in exploring, including pharmaceutical cannabinoids, which are available in Canada. Ultimately, the ability for youth to access regulated, consistent product from a licensed and tested source with a physician's guidance is better than relying on the illegal market. It is also important to consider that many youth are managing particular symptoms rather than a diagnosed medical condition, and these conversations also create opportunities to discuss other health interventions, either in tandem with or in lieu of cannabis use. For example, if a young person is self-medicating with cannabis to manage their anxiety, suggesting additional avenues to help manage anxiety, such as counseling, can be helpful.

Young people rarely have the opportunity within drug education programs to discuss their use of cannabis with the most important adults in their lives.[32,33] This signals that interactive programming, which is focused on active participation and discovery learning, is largely absent within drug education. Interactive cannabis education can have a greater impact than lecture-style, teacher-led delivery.[34] Typical non-interactive programs include providing educational material on the harmful effects of drugs ("knowledge dissemination"), or about the relationship between emotions and drug use ("affective education").[35] Multiple reviews have shown that these methods in and of themselves do not have significant impacts on drug use.[36,37,38,39] Studies have drawn attention to how interactive and balanced discussions around cannabis can create supportive environments to aid youth in their health decision-making.[40]



In school-based drug prevention assessments, non-interactive teaching leads to improved knowledge, but utilizing interactive methods shows improvement in both knowledge and attitudes.[41] Interactive teaching methods that maximize communication between teachers, students, and their peers have proven effective for prevention, and improving self-reported legal and illegal drug use.[42,43,44] Additionally, creative methods, such as films created for the purpose of exploring cannabis use and decision making, have been shown to be effective in encouraging reflection and dialogue around substance use.[45,46] Innovative methods fostering discussion about decision making and cannabis use which do not rely on traditional lecture and textbook instruction, and are not moralistic, are similarly positive, and highlight the importance of novel resources that incorporate and allow youth to offer their perspectives on the topic of cannabis use.[47] Innovative methods may also be extremely relevant for neurodiverse youth, and our approaches should acknowledge that young people have different learning styles. Just as we see diverse teaching practices become more common in standard academic curricula, this innovation must also be applied to drug education.

1.3 MEANINGFUL INCLUSION

- Young people have a right to be included in the development of cannabis education to ensure education is relevant and reflective of their experiences
- Cannabis education should avoid negative stereotyping and should value youth as leaders and contributors
- Consulting with youth is critical to successful and effective approaches which meet the needs of diverse youth

Youth are often not given the opportunity to participate in key decisions that affect them, and as such, there can be a lack of understanding around the needs and visions of youth with respect to their own social inclusion. This is particularly true in policy and education design, as well as implementation. Cannabis education and design approaches should avoid tokenism (i.e., the practice of symbolically including a young person or small group of youth to appear inclusive, without offering meaningful opportunities to participate), imbalances of power, and negative youth stereotyping. They should also challenge attitudes that frame youth as incapable of taking on leadership roles, and should include partnerships within various youth driven organizations and programs.[48] Youth should be engaged as credible partners whose input is valued and who have a right to provide input and hold decision-making power.

> Youth should be engaged as credible partners whose input is valued and who have a right to provide input and hold decision-making power

Young people also recognize their participation in educational reform efforts as a social justice issue.[49] Contrary to stereotypes of youth as "apathetic," given the opportunity and support to participate in these efforts, youth can be authentically engaged in effective partnerships to inform educational efforts. Youth can also offer insight into how their lives, particularly how they assign meaning and prioritize changes to cannabis education, can vary by race, class, gender, age, and sexual orientation. Best practices on youth substance use education suggest that consulting with diverse youth is critical to program effectiveness.[50,51,52]

Involving young people contributes to ensuring that drug education is relevant to their needs.[53] Aside from their inclusion in the development of drug education tools, youth involvement in education delivery has also been associated with improved efficacy of drug use prevention programs. This can take the shape of peer-led delivery, which has shown some promising results, in addition to interactive learning.[54] Youth should be given opportunities to be active "meaning-makers" in their own lives, which can take a variety of forms such as involvement in the creation of materials, providing continual feedback and evaluation, and participating in implementation and delivery.

1.4 DELIVERY BY A TRAINED FACILITATOR OR PEER

- Drug education should not be delivered by law enforcement or other figures of authority
- In delivery, trained facilitators and peer-based programs have shown some promising results but should still follow best practices, such as avoiding fear-based and abstinence-based approaches
- Including youth as facilitators can also be part of an approach that centres youth experiences in development and delivery, and can enrich open dialogue

There are questions around who is best to lead drug education programs, with choices ranging from teachers, peers, legal authorities, or professional program providers. Broadly speaking, some youth report negative attitudes towards police officers,[55,56] which suggests police presence in schools may leave some students who already hold negative attitudes feeling alienated in school. However, this depends on range of contextual factors, such as individual characteristics, neighborhood environment and past encounters with police.[57] Widely used drug education programs such as D.A.R.E. have traditionally relied on police delivery, and have been demonstrated to have no significant impact on youth drug use.[58,59] Other studies have highlighted ethical issues with having law enforcement in schools, including in an educational role, noting a tension between traditional law enforcement duty taking precedence over education and mentoring.[60]

Peer-based programs have been successfully used in a range of contexts, including substance use, sexual risk behaviours, and HIV prevention among young people

When considering the differences in program delivery by teachers, peers, or program providers, there is no clear answer. Drug prevention programs led by peers can be just as effective as programs led by adults with proper training and support,[61,62,63,64] but professional program providers generally outperform both peers and teachers.[65] However, this is often tied to ensuring best practices are adhered to, such as interactive programming and non-judgmental messaging. Peer-based programs have been successfully used in a range of contexts, including substance use, sexual risk behaviours, and HIV prevention among young people.[66] There is promising evidence to suggest that peer intervention models can both change behaviour and improve comprehension. This also provides another opportunity to engage young people in drug education, ensure messaging is relatable and consistent with their experiences, and foster open dialogue.

Since peers are likely to be embedded in similar social groups and communities, they often hold greater credibility than adults because they share a common understanding of social status, peer culture, and youth norms. This can mean that messages resonate to a greater extent. Further, the actual process of being a peer leader has also shown to be beneficial and result in enhanced confidence, self-esteem, communication skills, and behavioural change.[67] Simply put, young people may feel more comfortable discussing their experiences with someone who is close to their own age and who "gets it."

1.5 STARTING EDUCATION EARLIER WITH AGE-APPROPRIATE CONTENT

- The development of a healthy and informed relationship with cannabis among those who choose to use requires early and continual dialogue among young people, parents, and educators
- Education should include a discussion of both potential risks and benefits, and promote youth agency and decision-making skills
- Evidence suggests universal programs are more effective if delivered at an earlier developmental stage while individuated programs are more effective at later developmental stages

At home, there is no one specific age to begin discussing cannabis. However, research demonstrates that interventions are largely more likely to be helpful if the discussion is started before a young person tries cannabis for the first time. Parent-child communication has been shown to encourage healthier choices and reduce the risk of earlier onset of drug use more generally.[68] Other key variables related to parent-child communication around substance use include positive parenting and family management strategies, such as setting clear expectations,[69,70,71] family support, [72] and ongoing communication.[73,74]

When approaching cannabis education with youth, parents and educators must often navigate the challenges of speaking about both the evidence-based risks and benefits of cannabis use, including what to say and how to say it. In order to minimize harmful behaviours and help youth make informed decisions regarding the use of cannabis, the inclusion of evidence-based conversations should prioritize young people's agency and decision-making capabilities, as well as assist youth in understanding the impacts of cannabis use.

In schools, educational strategies can be implemented at all grade levels, and drug education should be ongoing from kindergarten to the final year of high school.[75] However, the vast amount of research supports the idea that drug education is most effective when delivered prior to initial use, as well as when youth are likely to experience their first exposure to cannabis.[76,77] Keeping in mind that the onset of use varies in different populations and with different types of drugs, cannabis initiation is most common at 15 years of age.[78,] Further key transition points for drug education have been identified by The Alberta Alcohol and Drug Abuse Commission as grades 4, 7, 9 and 11,[79] and many sources agree that interventions should start *well* before the ninth grade.[80,81,82] Since the effectiveness of cannabis education is heavily influenced by the targeted age group, a developmental perspective on substance use prevention and related interventions is important. To determine appropriate timing, we should consider both the age of substance use initiation and differences in the psychological and cognitive needs and capacities of the age group.[83]

The vast amount of research supports the idea that drug education is most effective when delivered prior to initial use, as well as when youth are likely to experience their first exposure to cannabis

While the research is mixed, universal programs seem to be more effective when implemented earlier in the developmental cycle, and selective or indicated drug education programs are generally more effective later, around the average age of initiation.[84] Universal programs are those that support development of general basic skills, such as problem solving, while selective or indicated programs employ strategies that target subgroups of the general youth population (e.g., at-risk youth). Finally, while younger children may benefit from programs that focus on multiple drugs, research suggests older adolescents benefit more from programs that focus on a single drug.[85,86,87] Youth's drug education should occur at multiple stages, and continued education and conversations are just as relevant in the home as in schools.

1.6 SUPPORTING PARENTS TO HAVE AGE APPROPRIATE AND OPEN CONVERSATIONS

- Families also need support to initiate and encourage ongoing conversations about cannabis
- Parents are often left out of drug education, but can play an essential role in ensuring consistent messaging around cannabis, particularly in a legalized context
- It is never "too early" or "too late" for family communication about cannabis

For some parents and guardians, discussing cannabis use can be intimidating because of a lack of knowledge or experience around the effects of cannabis. Supporting families in initiating these conversations can provide additional support for youth, so parents are not "left in the dark," as often happens with drug education. For parents and guardians, this means discussions around cannabis use should be ongoing, open, and non-judgmental. Parents, for example, should decide what their expectations are, but also seek to encourage open and honest communication. Some family-based programs have been implemented with varying levels of effectiveness. They typically aim to work with family members in an attempt to modify and manage beliefs, communication processes, and behaviours within the family. Family-based programs have also had some success in creating positive change in both individual behaviour and family interaction patterns.[88,89] However, there is literature that demonstrates family-based approaches are not as effective with vulnerable families, and operates from the assumption that parents, and by extension families, are skilled communicators, which may vary from family to family based on context and experience.

With younger adolescents and children, parents may take a more casual approach. For example, rather than formally sitting down for face-to-face dialogue about cannabis, parents may choose to bring up the topic when the situation arises. Conversations can emerge organically after seeing cannabis use in film or television, or when parents and children are discussing school events. Most importantly, research has demonstrated that it is not the formality but the *regularity* of the discussion that leads to more successful outcomes with young people. For example, one study found that consistent monitoring and communication about cannabis from an early age (from ages 12 to 14) led to decreased cannabis use.[90] They note that many teenagers begin cannabis experimentation during this early, developmental period, and find that "efforts to improve the level and consistency of parental monitoring and communication may be a fruitful target for prevention."[91] Additionally, studies suggest that holistic education that includes both parents and the community can create better outcomes for young people.[92,93] This means, ideally, educators, parents, and other key influencers would be communicating and attempting to work towards comprehensive and consistent messaging around cannabis use.

For parents and guardians, this means discussions around cannabis use should be ongoing, open, and non-judgmental

It is never too early or too late for family communication about cannabis. The involvement of parents can be an effective harm reduction strategy at many stages, including early adolescence. Although they spend significantly less time with their parents as they get older and peers become more important, parents still remain an important influence in their lives of young people.[94,95]

Helping Parents Approach the "Cannabis Conversation" [96]

Many parents do not know where to start in approaching a conversation with youth about cannabis. Some considerations for parents are presented below.

1. **What do you hope to get out of this conversation? What are your boundaries?**
2. **Will this conversation be about the "facts" around cannabis use, or are you interested in their experiences and use?**
3. **Remember that finding common ground is important – this might mean putting your personal opinions aside to listen.**
4. **Stick to the facts where you can – being judgmental may close the door to honest conversation.**
5. **Remember to listen and keep the conversation balanced.**
6. **Instead of focusing on the negatives, focus on positive choices, such as not driving under the influence or not mixing cannabis with other substances such as alcohol.**
7. **Talk to them about their future goals and focus on those.**
8. **It is important not to get upset at them for being honest – particularly if you ask them to be.**
9. **If they are using cannabis already, include a conversation around how they can mitigate risk to themselves and others by adopting harm reduction strategies.**
10. **Use open-ended questions and do not interrupt.**

1.7 INCLUSION OF HARM REDUCTION

- Abstinence-based education has been shown to be ineffective in reducing risks associated with drug use or sexual activity among youth
- Emerging research suggests the importance of including harm reduction strategies in drug education to address the needs of young people, including those who may already be using cannabis
- Harm reduction has been shown to be most effective with older youth (senior high school and above) and heavy youth cannabis users
- Harm reduction strategies do not condone drug use, and has become increasingly accepted as a pragmatic approach

Education that focuses solely on abstinence has been demonstrated to leave young people to develop their own understandings, knowledge, and skills to deal with drug use and drug-related situations, and provides little or no assistance to youth who may have already tried drugs or are currently using drugs.[97] Further, young people "receive adult-driven public health messages emphasizing the harms of cannabis, yet frequently hear about permissible medicinal use and are exposed to an environment where recreational use occurs among peers and adults."[98]

Many public health researchers have pointed out that "just say no" may work for some youth some of the time, but does a disservice to youth who will experiment with cannabis regardless of messaging. For these youth, being equipped with the facts will allow them to make better choices, and talking to youth about making safer choices will not cause them to use cannabis. For example, in the context of sexual health education, research has demonstrated the effectiveness of comprehensive education in delaying initiation, reducing sexually transmitted diseases, and avoiding unwanted pregnancy, and that these programs do not encourage youth to start having sex.[99,100] Similarly, an approach to prevention and education that focuses on both reducing the harms and giving young people the tools to make informed choices has become increasingly utilized as a more realistic approach to drug education.[101,102,103] In the case of cannabis use among young people, reducing harms can still promote abstinence as a way to minimize harms without making it the sole focus.

> "JUST SAY NO" may work for some youth some of the time, but does a disservice to youth who will experiment with cannabis regardless of messaging

Harm reduction efforts are rooted in the goal of reducing the risks and harms associated with drug use, rather than eliminating drug use entirely.[104] This approach has been shown to be more effective than abstinence-based drug education.[105] Access to harm reduction information has been shown to lead to more positive decision-making in relation to use.[106] Drug education which includes harm reduction principles has demonstrated high levels of cultural acceptability and approval among target populations, and has also been shown to impact knowledge, attitudes, and self-reported behaviours (both planned and actual).[107] Harm reduction approaches have also been received well in reduction of alcohol misuse,[108,109,110] sexual health,[111] as well as tobacco use and experimentation.[112]

With older youth (ages 17 to 25), harm reduction strategies have indicated some promising outcomes related to cannabis use.[113,114,115,116] For example, a growing body of evidence is developing around "Brief Interventions" (BIs), where short and easy to administer interventions focusing on "information, awareness or motivational components [are] targeted at pre-defined risk or target groups, and can be delivered in

medical (e.g., General Practitioner offices) or more general, non-medical settings."[117] BIs have shown to be effective in changing risk behaviours around drug use, such as in the context of driving,[118] and are cost-effective strategies.[119] In one sample of high-frequency cannabis users from a university student population, BIs were delivered in person and through written materials, and included fact based information on cannabis, suggestions on how to modify its risks, and brief motivational components such as identifying possible barriers to reducing risks of harm. Follow-up assessments demonstrated short-term reductions in key risk indicators, results of which are comparable to what has been traditionally accomplished through more time- and resource-intensive treatment.[120] BIs have also been shown to be an effective approach in other studies of high frequency youth cannabis users.[121,122,123,124] Other studies support that harm reduction is most effective with older youth (senior high school students and above), versus those in junior high school.[125] Harm reduction has also shown some success with high-risk populations, and adolescents who already use cannabis,[126] particularly in reductions in heavy cannabis use or fewer occurrences of driving under the influence.[127] Educators should consider these contextual factors in deciding when to include harm reduction strategies in cannabis education.

Historically, there have been concerns that including harm reduction strategies in drug education condones drug use, but the provision of harm reduction information has become increasingly accepted as a pragmatic approach in various contexts. One of the few studies that looked at the acceptability of harm reduction approaches sought to explore harm reduction drug education in schools and community settings. [128] This study of junior and senior high schools in Nova Scotia found support for harm reduction approaches in senior high school settings. The intervention was found to reduce risks and negative consequences of both alcohol and cannabis use, coupled with evidence that the school community accepted this type of programming.

1.8 EDUCATION TAILORED TO THE SPECIFIC CONTEXT

- There is no one-size-fits-all approach to cannabis education, and what may work in one context may not work in another
- Young people are diverse with different backgrounds, experiences, needs, and abilities, and as such, cannabis education should always be tailored to the context and population
- As with formal programs, there is no "model" approach for families in how they approach cannabis education with youth

There are many different approaches to cannabis education – and specific contexts and the youth population should always be considered. For example, the role of culture is important in the context of drug education in schools and families. Culturally adapted and culturally grounded substance use prevention and intervention programs emphasize the importance of identifying effective strategies that are rooted in the cultural group of focus,[129] and may garner more "buy-in" from members of a particular cultural group because the messages are likely to be more relevant to them. Additionally, each substance may have distinct beliefs associated with it (for example, the perceived degree of risk or potential harm of different substances), which may in turn stimulate different types of communication. The effectiveness of a message may depend on how well family members and educators can adapt their messages in response to the unique characteristics and experiences attached to a particular substance.[130]

Further, programming should be targeted based on the realities of that particular school or group (e.g., rural versus urban setting), and consider that some youth populations are at greater risk of developing issues with problematic substance use than others, including street-involved youth, youth involved with the criminal justice system, youth with co-occurring disorders, LGBTQ+ youth, as well as Indigenous youth.[131] As such, educational programs should be adapted to the needs of particular youth populations, which can be accomplished in part through their meaningful inclusion in the development of educational tools.

Apart from drug education in schools, there are gaps in various interventions delivered outside the school setting. Family interventions have shown promising results,[132,133] particularly since 'family structure and quality' are one of the risk factors identified with earlier onset of youth cannabis use.[134] Having open family communication can play a major role in substance use prevention, intervention, and coping.[135,136] As with formal programs, there is no one-size-fits-all approach. Parental prevention communication patterns might vary by family, so it is important to consider multiple strategies that parents can use to discourage harmful substance use among adolescents and to make informed choices.[137]

As with formal programs, there is no one-size-fits-all approach

1.9 ONGOING EDUCATION AVAILABLE TO YOUTH

- Cannabis education is more than a one-session conversation – multiple session programs with follow up have shown promising results in preventative outcomes
- Youth have a right to accessible, accurate, and ongoing drug education and support that can help them navigate different experiences and exposure to cannabis

There is ample evidence of the value in programs that involve multiple sessions.[138,139,140,141] Adequate coverage and follow-up (what is often referred to as "booster sessions" frequently occurring 3-6 months after initial programming) can also be important complements to this programming.[142,143] Research suggests that interactive, medium (6 to 10 hours) to high-intensity (11 to 15 hours or more) programs, and those with booster sessions appear to be most effective in terms of preventative outcomes.[144,145] Booster sessions designed to review and build on the original program content have been shown to increase the effectiveness of school-based programs,[146,147,148] where over time, the effectiveness of programs tend to erode.[149] While booster sessions demonstrate some effectiveness in helping to reinforce earlier lessons and ideas, the effectiveness of booster sessions also depends on other program factors, such as interactive delivery.[150,151,152] It should also be noted that some research has demonstrated the value of brief intervention programs (i.e., less than four months), which can also achieve positive results in reducing or changing drug taking behaviour.[153,154] Fostering the development of youth's cannabis literacy by providing ongoing access to fact based information includes ensuring sufficient program duration and intensity.

Further, young people have a right to honest drug education, which in turn impacts how equipped they are to make choices around their health. It is not enough for drug education to simply focus on abstinence in an effort to prevent young people from using cannabis. Comprehensive drug education must provide honest, age-appropriate information, which will ultimately arm young people with the skills necessary to take personal responsibility for their health and decision making. Youth will encounter cannabis, so honest information and ongoing discussions about cannabis will help them navigate the changing legal landscape and experiences with friends, family, and acquaintances.

Comprehensive drug education must provide honest, age-appropriate information

1.10 ATTENTION TO OVERLAPPING ISSUES OF RACISM, SOCIAL JUSTICE, AND STIGMA

- The prohibition of drugs in Canada has a highly racialized history that has resulted in the stigmatization of specific population groups. This should be acknowledged when talking about cannabis
- Acknowledging issues related to racism, social justice, and stigma also allows the educator or parent to tailor programs or conversations to the context, particularly when working with vulnerable populations
- The continued criminalization of drugs other
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The criminalization of drug use and people who use drugs is closely tied to the idea of stigma. Stigma refers to a perceived negative attribute that causes someone to devalue or think less of the whole person. Stigma can have an effect on how people are treated, including facing discrimination[155] or avoidance and condemnation by others.[156] Cannabis use has traditionally been stigmatized and associated with being 'deviant.' While the meaning and status of cannabis use continues to shift, there are still broader social consequences associated with being known as a cannabis user. A recent Canadian report on adolescent cannabis perceptions noted that young people fear being caught by parents or police because they don't want to be labeled as a "drug user."[157] This is generally aligned with stereotypes around frequent cannabis users, such as being known as a "stoner," "pothead," or "druggie." Stigma can act as a barrier in engaging youth in open and honest conversations around cannabis use and their own experiences, and other studies have noted that perceptions of stigma can be a barrier to discussing and admitting problematic cannabis use.[158] It is imperative to be cognizant of this barrier, which may mean creating safe spaces for cannabis education dialogue.

Stigma can act as a barrier in engaging youth in open and honest conversations around cannabis use and their own experiences

While it is important that youth know the historical context of cannabis prohibition when age-appropriate, being aware of the social injustices rooted within cannabis prohibition can also help educators tailor programs to the context, particularly when working with vulnerable populations.

Open conversations around these issues can help foster critical thinking around larger social issues intricately tied to the prohibition and legalization of cannabis in Canada

Addressing some of the injustices faced by groups who have historically been and continue to be marginalized, ignored, over criminalized, and subject to discrimination, can also allow the opportunity to talk about social diversity and social justice. Education that is cognizant of these historical and ongoing injustices, particularly when tailoring education to the context or to specific populations, can also allow educators (and parents) to be more conscious and critically reflect on whether stigma is embedded within the drug education program or their own personal values regarding youth and cannabis use, which can render the intervention less effective.

While this conversation may be more appropriate for older youth, and more research needs to be done to understand the extent to which these issues should be integrated into drug education, these issues are

important to how society thinks about and understands cannabis use. Open conversations around these issues can help foster critical thinking around larger social issues intricately tied to the prohibition and legalization of cannabis in Canada. Drug laws in Canada continue to treat drug use as a criminal justice issue rather than a public health issue and are important from a social justice perspective given that they disproportionately affect poor and minority communities.[159] The reliance on criminal enforcement has been shown to be ineffective, expensive, and leads to worse outcomes for individuals, families, and societies than drug use itself.

SECTION 2:
PULL AWAY CURRICULUM

The second section of this toolkit outlines core concepts educators and parents can draw on to familiarize themselves with cannabis and cannabis use, and can additionally be used as a resource to assist in the information delivery component of a comprehensive cannabis education program. As highlighted above, teaching youth the "facts" about cannabis should not be the only focus of cannabis education, but given the vast amount of resources – including conflicting research, internet sources, and myths – an overview of where the evidence sits can help guide informed conversations with youth.

Topics to be addressed include:

1. ***Cannabis 101 – What is it and how is it used?***
2. ***Reasons for Cannabis Use and Non-Use Among Youth***
3. ***Harm Reduction – What is it and why is it useful?***
4. ***Cannabis - A Historical and Legislative Background***
5. ***Assessing Potential Health Harms***

2.1 CANNABIS 101 – WHAT IS IT AND HOW IS IT USED?

LEARNING OUTCOMES

By the end of this section, you will:

1. *Learn about how cannabis interacts with the endocannabinoid system*
2. *Learn about the most common cannabinoids (including THC, CBD, and CBN)*
3. *Understand what cannabis is, including its effects, terpenes, and flavonoids*
4. *Understand a variety of ways cannabis is commonly prepared and consumed, including differences in onset and duration of felt effects*

CANNABIS

Cannabis is a generic term used to refer to a genus of flowering plant in the plant family *cannabaceae*.[160] it is the scientific name for a family of plants commonly known as "marijuana." Cannabis has a long history of use by humans for fiber (hemp), seed oils, seeds, medical treatment, and recreation.[161]

Slang Terms for Cannabis and its Felt Effects

Common Names for Cannabis	Common Slang for Felt Effects
• Bud • Cheeba • Chronic • Dagga • Dank • Dope • Herb • Ganja • Grass • Green • Kush • Marijuana • Mary Jane • Pot • Reefer • Skunk • Weed	• Baked • Blazed • Blitzed • Buzzed • Burnt • Cheeched • Faded • Fried • High • Lifted • Lit up • Ripped • Roasted • Stoned • Toasted • Tweaked • Wasted

THE ENDOCANNABINOID SYSTEM

When thinking about the effects of cannabis on the body, it is important to note that the human body is equipped with an *endocannabinoid system* – specialized receptors that are present throughout the central nervous system and located in peripheral tissues and the immune system. This system has been referred to as the "master regulator" for its homeostatic role (i.e., ensuring stability or balance) in the body's drive to "relax, eat, sleep, forget, and protect."[162] In short, the endocannabinoid system is a signaling system found throughout the body which helps to regulate many aspects of the body's internal workings including immune

function, appetite, metabolism, energy regulation, and pain. The endocannabinoid system plays an important regulatory function in many different parts of one's body, which is why it can play a role in managing symptoms such as chronic pain or nausea. The body's own natural cannabinoids can activate this system, as can components of the cannabis plant (e.g., THC).

CANNABINOIDS - THC, CBD, AND CBN

Cannabinoids (such as THC and CBD) are the active chemical compounds found in the cannabis plant. There are more than 80 different cannabinoids found within the cannabis plant.[163] The cannabinoid that is mostly known for its psychoactive effect is called THC, or delta-9-tetrahydrocannabinol. A variety of effects, such as the medicinal effects of cannabis, also involve a range of other cannabinoids, such as CBD (cannabidiol), CBN (cannabinol), and other plant molecules (terpenoids and flavonoids, which are not considered cannabinoids). The terpenoids and flavonoids in cannabis are responsible for flavour and aroma, and are also relevant to the felt effects of cannabis, such as whether a strain produces a calming or sedative effect. Each strain has its own terpenoid and flavonoid profile which contributes to its aroma and effect.[164] For example, limonene is a terpene responsible for a lemon-like aroma and is known to have uplifting effects,[165] and is also found in foods such as oranges and lemons. Taken together, these molecules contribute to cannabis' overall effect.[166]

THC

THC is the short term for delta-9-tetrahydrocannabinol. THC was originally identified as the compound that accounts for virtually all the pharmacological activity of cannabis. It is the primary psychoactive component of the cannabis plant responsible for the "high" from using cannabis.[167]

The euphoric effects of cannabis are primarily attributed to THC, but other cannabinoids have also been shown to have varying levels of psychoactivity. Psychoactive substances refer to substances that, "when taken or administered into one's system, affect mental processes" such as cognition.[168] The degree of psychoactivity can usually be determined by the quantity of THC in the product, however, other factors (including the presence of other psychoactive cannabinoids, such as CBN, as well as the effects of terpenes) may also play a role.

CBD

Cannabidiol, or CBD, is usually the next cannabinoid of interest in cannabis strains, particularly for those who use it medically. CBD mitigates some of the psychoactive effects of THC, including intoxication and sedation, and may contribute anti-inflammatory, anticonvulsant, anti-psychotic, anti-oxidant, neuroprotective, immunomodulatory, and anti-carcinogenic properties.[169,170] The presence of CBD in cannabis can alter the felt effect; a strain variety which contains CBD and little or no THC would not make someone feel "high."

CBN

Cannabinol, or CBN, is the degradation product of THC (produced when THC is heated or exposed to oxygen), and is most often found in aged cannabis products. CBN elevates the effects of THC and shares some characteristics with CBD. For example, CBN has anti-convulsant and anti-inflammatory properties with little to no psychoactivity, as well as a more sedative effect particularly when combined with THC.[171]

CANNABIS CHEMOVARS

Some people are surprised to learn there are a vast number of cannabis chemovars (also referred to as "cultivars" or "strains") available that have different profiles and effects. You can think of them as the different varieties of cannabis. There are two main sub-species commonly discussed: cannabis indica and cannabis sativa. Generally, strains are divided into three main categories: sativas, indicas, and hybrids. Sativas are strains which are more cerebral, energizing, and stimulating, whereas indicas produce effects which are more sedating and relaxing.[172,173] Hybrids are cross-breeds and contain both indica and sativa elements, and different combinations may produce varying effects. Importantly, research is beginning to shift away from the use of these simplistic categories and turning towards how terpenoids and flavonoids are responsible for, and contribute to, the felt effects of cannabis.[174]

EFFECTS OF CANNABIS

Cannabis affects people very differently, as it comes in a variety of distinct strains that produce different effects. As a rule of thumb, new users generally feel the effects more intensely than experienced users. For some, the use of cannabis can be relaxing and enjoyable. For others, it may result in feelings of tiredness or anxiety.

Cannabis has varying felt effects, but most common include feelings of euphoria, heightened sensory perception, elation, and appetite stimulation. The effect can depend on a variety of factors such as how often an individual uses cannabis, how long it has been since they last used cannabis, the strain of cannabis, and the mode of administration (e.g., infused food products versus smoking), among other factors. Commonly reported negative or less enjoyable effects include feelings of panic or fear, trouble concentrating, decreased coordination, and decreased interest in completing tasks.

Feelings of anxiety and panic are among the most common acute physical issues following cannabis use, reported by roughly 1 in 4 users,[175] and experienced more frequently among inexperienced users.[176] Physical symptoms that may be experienced can include nausea, vomiting, dizziness, drowsiness, dry-mouth, increased blood pressure, increased heart rate, and heart palpitations.[177,178,179] Symptoms tend to reach their maximum within two hours, but may last up to 8 hours depending on dose.[180] Symptoms from edible cannabis may last up to anywhere from 4 to 24 hours.[181]

Although the estimated lethal dosage of cannabis far exceeds that of any user[182,183] and there are no documented deaths from a cannabis overdose when used by teenagers or adults,[184] consumption of cannabis may induce several unwanted adverse physical and psychological reactions. These adverse effects tend to be dose-dependent, and may vary according to other factors including age, personality traits, and predisposition to mental illness.[185]

COMMON METHODS OF CONSUMPTION

Cannabis is consumed using a variety of methods, each of which may result in a different onset and duration of felt effects.

INHALATION

Consuming cannabis by smoking or vaporizing is typically the most common method of consumption, likely due in part to the quick onset of effects.

Onset of effects: Rapid, from 30 seconds to 15 minutes

Duration: Between 30 minutes to 2 hours depending on strain and dosage; may last up to 8 hours

Smoking

JOINTS

Individuals can smoke cannabis in many forms. For example, many will roll cannabis into a "joint" or cigarette form using a paper which can be made from bamboo, rice, or hemp, among other materials. A typical joint contains anywhere from 0.5 to 1 gram of cannabis.

SPLIFFS

"Spliffs" are joints which contain both tobacco and cannabis and are rolled in a similar paper. Heavy long-term use of cannabis without harm reduction techniques may lead to respiratory irritation, and this risk is elevated in users who also smoke tobacco. Tobacco may also provide a head rush, and smoking tobacco generally has been shown to contribute to serious adverse health consequences.

BLUNTS

"Blunts" are rolled with tobacco leaf/paper, or can be a hollowed-out cigar filled with cannabis. While blunts can range in size, they are typically filled with much more cannabis than a joint, and depending on the exterior wrapping used, can be flavoured. The added tobacco leaf can provide a head rush effect similar to smoking a spliff.

PIPES AND WATER PIPES

Other common forms of inhalation include smoking smaller amounts using a glass pipe or water bong which may result in less respiratory irritation. Both glass pipes and water pipes come in a variety of styles and designs, and some incorporate the use of water. Water pipes can come in slightly different variations, including water bongs. Water bongs pass the smoke through water, which is said to reduce exposure to harmful compounds. Additionally, the water helps to cool the smoke which lessens the irritation on one's respiratory system. These come in a variety of styles and types, including those with multi-chambers, percolators, and are made from a variety of materials including glass, acrylic, and ceramic.

CONCENTRATES, INCLUDING "DABS"

Dabbing is used to refer to the practice of melting a cannabis concentrate over a heat source and inhaling the subsequent vapor. While the term "dabs" is often used to refer to the practice itself, it is also increasingly used as an umbrella term for all cannabis concentrates. In the latter, dabs can refer to a number of cannabis-derived substances such as wax, shatter, resin, or rosin, where the main difference is the method used to make them. The process of administration involves a device similar to a water bong called a "dab rig" or a concentrate vaporizer. Dabs have risen in popularity because they contain much higher concentrations than botanical cannabis (unaltered cannabis flower), as some concentrates contain as much as 70-90% THC. However, lower doses are needed to achieve the desired effect or high.

Vaporizing

Rather than burning the cannabis and inhaling the smoke, many people who use cannabis prefer to use a vaporizer which heats botanical cannabis to a temperature that releases the active ingredients into a smoke-like vapor which can be inhaled. Vaporizing mitigates some of the harms associated with smoking, such as

the carcinogens and other by-products inhaled from burning cannabis and paper. This is therefore considered a less harmful method of consuming cannabis, particularly for people who use regularly. Some people who use cannabis also prefer vaporizing because it is cost efficient, using less cannabis per dose than smoking, as well as drastically reducing the scent of burning cannabis.

Importantly, there are a variety of different products and technology that are covered under the broad term "vaporizing". Vaporizing can refer to the process of loading dried cannabis into a device as described above, but it can also be used to refer to disposable and rechargeable cartridge-based "vape pens". Vape pens may be used by some people who use cannabis to vaporize cannabis concentrates and botanical cannabis, the former much stronger in effect. Additionally, there is risk associated with vape pens and cartridges sourced from the illicit market, which are unregulated and as such, may have dangerous additives or chemicals.

INGESTION

Broadly, ingestion refers to the oral consumption of cannabis products, such as infusions into edible chocolates, oils, or beverages.

EDIBLES

Onset: Depends on a variety of factors such as contents of stomach and metabolism, users typically experience the effects in 30 minutes to 1.5 hours

Duration: Between 1 to 6 hours; may last up to 24 hours, depending on dose

Edibles refer to cannabis infused food products such as cookies, brownies, coconut oils, and butters. When cannabis is ingested, the effects take substantially more time in terms of onset, and the effect is often described as being more of a physical effect, more intense, and longer lasting than smoking. Precautions must be taken when ingesting cannabis for the first time. Starting slowly with edible products is important because of the delayed onset of effects. Ingestion can provide some benefits over smoking, including a reduction in throat and lung irritation. The strength of an edible product is dependent on the strength and dose of the cannabis infused product. In the Canadian market, one of the new products available include cannabis beverages. While it may seem intuitive to think of cannabis beverages as similar in onset and effect to edibles, these products oftenuse nanoemulsion (e.g. a process which absorbs the active ingredients into the body more quickly without requiring external oils or fats – commonly used in pharmaceutical and cosmetic industries), and take effect more quickly – in about ten minutes, and the effect can last between 2-4 hours. However, strength per beverage vary across products – ranging from 0-2 mg of THC to 10 mg of THC (maximum).

INGESTIBLE OILS

Onset: Similar to above; 30 minutes to 1.5 hours

Duration: Between 1 to 6 hours, depending on dose

Oils are a method of concentrated extraction, typically by using solvent-less supercritical CO2 extraction and combined with a carrier oil such as coconut, MCT, sunflower or olive oil. They can offer more precise dosing and longer lasting effects than inhalation, and similar to edibles, are absorbed into the body through the digestive tract. , Many prefer to add drops to food or beverages like orange juice, coffee, or tea, andthe onset and duration is still similar to that of edibles.

There are other ways cannabis may be consumed and used, and we have only focused on some of the most common methods.

2.2 REASONS FOR CANNABIS USE AND NON-USE AMONG YOUTH

LEARNING OUTCOMES

By the end of this section, you will:

1. ***Understand a variety of individual motives for use***
2. ***Understand a variety of social factors which may contribute to use, including "peer pressure"***
3. ***Understand what factors account for non-use in youth***
4. ***Understand where youth access cannabis***

WHY DO YOUTH USE CANNABIS?

The reasons why young people use or do not use cannabis are complex and multifaceted. This section will examine a variety of factors thought to influence use and non-use among youth, with "use" referring to initiation and continued use, and "non-use" referring to abstention or discontinued use. It should be kept in mind that some experimentation in adolescents is considered "normal," even healthy, among peer groups, and that the majority of users do not experience negative effects, or develop long term problematic consumption patterns.[186] For example, research generally shows cannabis use increases from early adolescence to mid-20s, then steadily decreases.[187,188] However, earlier adolescent initiation of use can be predictive of future problematic and harmful use.[189,190] Young people might have more than one reason for choosing to use or not use cannabis, and framing youth cannabis use as "deviant" or "bad" behaviour is not useful, particularly given that use has become increasingly common among youth and young adults.[191]

Further, past work has identified risk and protective factors associated with a range of potential outcomes, including problematic substance use. Risk factors can include influences and situations which can increase an individual's risk for substance misuse, while protective factors may lead to reduced risk. These can include local community factors, school and peer factors, individual characteristics, family factors, and societal and political issues. The underscoring idea is that we should consider not just the individual, but also family, the wider community, and society, and how they interact with one another.[192]

While studied to a lesser degree, there are some common reasons young people decide to abstain from use.

Motives for cannabis use can change and evolve. In practice, youth may not rigidly fit into one category for the reasons why they may or may not use cannabis. Further, boundaries between perceived medical use and recreational use are not always clear. It may also be important to consider traditional and cultural uses of cannabis as reasons for use. For example, cannabis has been "intimately associated with magical, medical, religious, and social customs in India for thousands of years," particularly "bhang," a cultural drink made from cannabis leaves, milk, sugar, and spices. [193] Another example can be found in Jamaican culture, where some cultural groups view cannabis, or "ganja," as an herb that has both religious and medicinal value.[194]

INDIVIDUAL MOTIVES FOR CANNABIS USE

When thinking about why people use a particular substance, we often rely on the "motivational model," which views an individual's choice to use a particular substance as influenced by the perception of that substance being able to fulfill particular needs.[195] This model suggests that different motives for use will accordingly have unique behaviour and use patterns.[196,197] The motivational model has been used extensively in the research literature to understand the underlying factors influencing cannabis use among youth.[198,199,200] Some of the most common factors explored include pleasure, experimentation, conformity, coping, and medical use. The support for each is presented below, noting these are not presented in any particular order.

i. Pleasure

One of the most common reasons given for cannabis use is simply for the purposes of general enjoyment, being social, getting "high," and to relax. Enjoyment and relaxation have been cited as a primary factor for repeated or continued cannabis use.[201,202] This also includes enjoyment derived from a reported "expansion of awareness" and heightened senses,[203] including the enjoyment of music, engagement in creativity, and taste. Studies that draw on self-reported data show that individuals who use cannabis for social and recreational purposes tend to smoke less frequently and in the presence of others compared to individuals who use cannabis for relief or coping purposes.[204] Qualitative interviews with youth reveal that smoking in the presence of others, as a social activity, may promote group euphoria and happiness, which may motivate continued use.[205] Further, many young people who use cannabis occasionally and socially do not often experience problematic use.

ii. Experimentation

Experimentation and curiosity have been cited as significant factors influencing first time cannabis use among youth.[206] Young people who cite "experimentation" as a primary motivator may discontinue use after trying cannabis, tend to use less frequently, and are less prone to developing substance use problems compared to individuals who use for coping and (non-experimental) recreational purposes.[207] Experimenting with cannabis and other illegal substances among youth can be considered exploration during this developmental stage and is associated with mostly positive peer interaction.[208,209]

iii. Social/Socializing

Conformity as a motive refers to cannabis use for the purposes of connecting or "fitting in" with peers,[210,211] but the relationship is unclear. This is typically connected to peer networks, with evidence supporting an association between cannabis use and cannabis using peer networks.[212] However, this may mean that youth are motivated to use in the presence of other cannabis using peers, or that the presence of cannabis using peers is reflective of an individual interest in cannabis.[213] A study investigating how youth negotiated differences in individual beliefs and peer norms showed that individual beliefs were strongly predictive of cannabis initiation.[214] In other words, youth who did not have an individual desire or interest to use often would not use or try cannabis regardless of peer norms. The effects of peer networks on cannabis use will be further explored in the following sections.

iv. Coping

Coping refers to cognitive processes and behavioural strategies that individuals adopt to deal with stress.[215] Among young people, stress and tension reduction are some of the most common reasons given for cannabis use.[216,217,218] The use of cannabis for relief is influenced by the perceived relaxation effects.[219] While the

presence of stress alone is not considered a significant risk factor for cannabis use, differences in coping strategies have been shown to influence use or non-use.[220]

Coping strategies can either be adaptive or maladaptive. Adaptive coping strategies include cognitive and appraisal coping (such as reframing and putting issues into perspective), behavioural coping (relaxation), and seeking parental support.[221] Maladaptive coping strategies include the use of anger (i.e., emotional outbursts, hitting, screaming, throwing objects), feelings of helplessness, and avoidance.[222] The use of maladaptive coping strategies has been found to be strongly related to cannabis initiation and continued use over time.[223] Youth who report coping as a primary reason for use tend to have worse mental health, and experience more distress and stressful life events than their peers who primarily use cannabis for recreational or social reasons.[224] These sources of stress have also been primarily linked to poor familial and peer support.[225] The use of cannabis for coping is also related to problematic use over time.[226]

v. Medical Use

Youth also report using cannabis for medical reasons, both as self-medication and, less commonly, with physician authorization. This includes, but is not limited to, relief from depression, anxiety, sleeping issues, physical pain, and to help with concentration.[227]

While mental health issues, such as depression and anxiety, are often assumed to be strong predictors of use,[228] the causal link is inconclusive (see Section 2.5 for more information on cannabis use and mental health). There is evidence for both the idea that cannabis is used to alleviate symptoms or be more sociable (i.e., self-medication hypothesis) and that isolation from peer networks due to mental illness symptoms limits possible peer influences and access to cannabis (i.e., buffer hypothesis).[229]

In a six-year longitudinal study investigating the association between social anxiety disorder (SAD) symptoms, peer involvement, and cannabis use among adolescents, it was found that SAD symptoms were associated with higher probabilities of non-use of cannabis and a lower frequency of cannabis use. In line with the buffer hypothesis, initiation and frequency of use were influenced by social isolation, which limits the potential for peer involvement and access to cannabis. However, the association remains inconclusive and contextual factors such as differences in peer group structures and norms, and the changing nature of mental illness symptoms, must be considered.[230]

Importantly, research has found an association between youth who report self-medicating with cannabis and their perceptions of the inadequacies of the medical system and ineffective medical interventions. In this case, many youth reported feeling invalidated by the medical system, dissatisfied by solutions and medications offered, and within this context, cannabis was framed by young people as the "better" and natural alternative to pharmaceuticals.[231]

SOCIAL FACTORS INFLUENCING CANNABIS USE

The research shows a distinct overlap between individual motives and social factors, where the latter is interested in how social interactions and relationships affect or impact individual choices. For instance, the use of cannabis as a coping mechanism is often facilitated within the context of youth encountering traumatic life events and illnesses, as well as with a lack of support from family and peers.[232,233] Therefore, individual risk factors can change over adolescent development according to parental socializing, peer bonding, and normative beliefs.[234] Social level factors include the family and parental network, peer networks, and social norms.

i. Family and parental network

Family and parental networks have been shown to significantly influence lifetime cannabis use among youth in several ways.[235] Whether family and parental networks pose a risk or can be considered a protective factor for cannabis use is affected by family structure, referring to whether the family is "intact" or "disrupted" (i.e., divorce, separation, single parent), and family quality, referring to management practices (i.e., supervision, communication, parenting style, parental substance use).[236] Disrupted family structure characterized by low bonding can be a significant source of stress for adolescents, and when coupled with poor family management practices (i.e., low supervision and control), youth are both more likely, and have more opportunities, to use cannabis.[237] In Canada, adolescents with disrupted family status are approximately 65% more likely to use cannabis than youth from intact families.[238] The consistent differences in social patterns between users and non-users, with lifetime cannabis users spending less time with family and more time with drug using friends, reflects the importance of management practices and family bonding.[239] It's important to keep in mind this research has generally focused on heteronormative, dual parent, middle class families.

Educators should also consider that not all families have access to time, resources, knowledge, and skills for positive interactions about cannabis with youth.

Family and parental networks can also influence cannabis use among youth through the mechanism of modeling behaviour, which posits the family as the primary unit responsible for the socialization of children.[240] Youth from dysfunctional families often lead more stressful lives, and when combined with a lack of support from family members, are prone to adopting maladaptive coping strategies when faced with stress.[241] Furthermore, studies show that youths' expectation of the stress-relieving properties of cannabis is influenced through observing significant adults in their lives using cannabis to deal with stress.[242,243] In summary, family and parental networks can influence cannabis use through the modeling of maladaptive coping strategies and parental use of cannabis, but more work is needed to explore the different contexts of use and how different communication and education strategies may influence this relationship (e.g., parent's medical use).

ii. Peer network

In comparing users to non-users, some marked differences in social patterns are apparent, with people who use cannabis generally reporting spending less time with family and more time with friends who use cannabis.[244]

Peer pressure or peer preference?

While peer networks are a determinant of use, the causal link between peer networks and cannabis use is unclear.[245] "Peer pressure" conceptualizes youth as being "pressured" into engaging in cannabis use.[246] Peer pressure has been critiqued for being overly simplistic in explaining the association between peer networks and drug use. While evidence shows an association between having peers who use drugs and individual drug use, it is likely evidence of peer selection (or preference), rather than peer pressure.[247]

Peer preference or selection considers peer networks as a collection of individuals who gravitate towards friends with similar interests to their own. In this view, instead of an individual being "lured" into using cannabis, individuals with an interest in using cannabis seek friends who affirm and support this choice. Therefore, peer networks may create a more conducive space for youth to do what they *already want to do*.[248] Instead of situating blame on the youth who uses cannabis, peer preference recognizes the agency of individuals to choose their own peers and to abstain or use drugs.[249] This perspective is supported by other studies, which revealed that regardless of peer norms, individual beliefs regarding cannabis can be strongly predictive of cannabis use initiation.[250] However, there is evidence that supports both peer pressure and

peer preference, where some research has suggested that peer networks may promote initiation, and continued use is perpetuated through seeking out cannabis using friends.[251] Finally, some studies have noted an association between the perceptions of peer use and subsequent use[252] (i.e., if one thinks all their peers engage in cannabis use, they are more likely to use cannabis). Importantly, youth often overestimate peer use, so a discussion of prevalence among young people can help to ground this discussion.

iii. Social norms

While studied to a lesser extent in favour of individual level risk factors, changing social norms surrounding cannabis use and its historical status as an illegal drug can shift and influence patterns of use.

"Normalization"

There are studies that look at how the normalization of cannabis use among youth may contribute to use or non-use. This typically relies on the understanding of people who use cannabis as "non-deviant,"[253] and positions recreational users, conceptualized as occasional users, against habitual or problematic users.[254] Several indicators signal the normalization of recreational and occasional cannabis use, including (1) increasing access and availability, (2) increasing prevalence of use, (3) increasing tolerant attitudes towards people who use cannabis, (4) cultural accommodation, and (5) policies of legalization and regulation of cannabis markets.[255]

An important nuance in studies that look at cannabis use and normalization relies on the idea of "differentiated" normalization – meaning that *some* drugs and drug use may be more normalized for *some* groups of people.[256] Cannabis use has varying degrees of acceptability[257] and cultural identification and experiences around cannabis use therefore remain important to a broader discussion of reasons for use and non-use. For example, occasional use and employing discretion around when and where is considered appropriate use is important to how young people think about cannabis, whereas heavy or chronic use of cannabis is seen as problematic.[258] Social acceptance of cannabis use is increasing more generally in North America.[259] In self-report surveys, Canadians report increasing tolerance of recreational cannabis use as a "lifestyle" choice.[260]

How do we promote norms around appropriate cannabis use?

Norms are established, but often informal, rules or guidelines around appropriate behaviour or conduct. Some norms around responsible use could include:

- **Cannabis use and driving – while youth acknowledge that cannabis is less impairing than alcohol,[261] it is important to be clear that this does not mean it is safe to drive after using cannabis or to drive with others who have recently used cannabis.**
- **Being mindful of appropriate times and places for use – similar to alcohol, cannabis use should not impede responsibilities like school or work, as well as hobbies and activities.**
- **Encouraging respecting the rights of others (particularly non-users) – be cautious and courteous in terms of when and where cannabis is consumed, and respect other people's choices to consume or not.**
- **Always storing cannabis responsibly – taking precautions to store cannabis safely, as well as keeping it away from children, is important.**

REASONS FOR NON-USE

While studied to a lesser extent, young people's reasons for abstaining or discontinuing cannabis use, particularly within a context wherein cannabis use is increasingly being normalized, are important to consider. Prominent reasons for non-use include concerns regarding psychological or physical harms, lack of interest, and avoidance of social consequences.[262]

i. Psychological or physical harms

In examining how youth's subjective perceived effects of cannabis impact cannabis use, past work reveals that compared to users, non-users expected more negative consequences, including cognitive and behavioural impairment.[263] In a nationally representative study of cannabis use among American youths, concerns about psychological and physical harm were a primary factor listed for abstaining. While potential for psychological or physical harm is a historically consistent reason for abstaining and research continues to highlight the complicated relationship between these outcomes, its relative importance has declined over time.[264] More recent youth perception studies have found youth generally think of cannabis as "safer" with minimal harms, particularly when compared to alcohol, tobacco, or other drugs.[265]

ii. Lack of interest

Another significant reason for abstaining among youth is simply a lack of interest. Among individuals who discontinued use, many cited that they did not have an interest in or did not enjoy the sensation of being "high."[266] Abstaining was also related to young people perceiving cannabis use as unaligned with their self-image.[267]

There is also support for considering the importance of youth agency in their decision-making process. In comparing significant factors for abstaining from illegal substances more broadly, one study found that several factors for abstaining were uniquely associated with cannabis compared to MDMA/ecstasy, cocaine, and hallucinogens. Compared to the other illegal substances, non-users acknowledged that cannabis was relatively easy to obtain and that the majority of their peers used it, reflecting that drug availability and peer networks may not be an important cannabis use determinant, at least among adolescents who lack interest in cannabis.[268,269,270]

iii. Avoidance of social consequences

While studies show that cannabis use and frequency of use peaks at 18, after this age many young people who discontinue use cite legal and employment consequences as a deterrent to continued use.[271] Among non-users, disapproval from family and parental networks, particularly stigma, was cited as a primary reason for abstention.[272] Other studies have confirmed that young people may fear being caught by parents or police because they do not want to be labeled as a "drug user."[273]

HOW DO YOUTH ACCESS CANNABIS?

Canadian youth generally report cannabis as an easily accessible substance. Often, cannabis is shared among groups or at social events, and finding someone to purchase from is relatively easy.[274] Youth often

report sharing cannabis (both getting cannabis from others and giving it away)[275] and when they do obtain it for free, it most often comes from friends or family.[276] Other points of access include purchasing from a friend or from an acquaintance.[277] While there is little formal data on young people accessing cannabis online through illegal websites, this may also be an avenue young people may use to access cannabis.

2.3 HARM REDUCTION – WHAT IS IT AND WHY IS IT USEFUL?

LEARNING OUTCOMES

By the end of this section, you will:

1. ***Understand what harm reduction is***
2. ***Understand practical ways to reduce the harms associated with cannabis use, through both abstinence and the reduction of risky behaviours for youth who are already using cannabis***

WHAT IS HARM REDUCTION?

> *"Taking a pragmatic approach to this generally understood phenomenon, harm reduction avoids taking a uniform stance that substance use is bad, but instead focuses on getting accurate and unbiased information on the harm of use to potential users, in order to help them make informed decisions about whether to use, and if they choose to use, what precautions to take to minimize their risk."*[278]

Harm reduction is a community philosophy that attempts to reduce the harms of drug use without necessarily reducing drug use itself. Harm reduction acknowledges that there are inherent risks involved with a range of behaviours and that there are ways to reduce those risks. Harm reduction can also be understood in the context of a range of activities other than drug use, as simple as wearing sunscreen or wearing a helmet.

REDUCING CANNABIS-RELATED HARMS

In order to ensure cannabis education is suitable for all young people, discussing strategies to reduce the harms of cannabis use is of critical importance to supporting responsible and safe use among those youth who may choose to use cannabis. In 2017, the Canadian Research Initiative in Substance Misuse (CRISM) released an evidence-based guide on how to improve health and minimize risk for Canadians who use cannabis.[279] The following discussion relies on CRISM's "Lower-Risk Cannabis Use Guidelines" (LRCUG), however, it is tailored to youth based on feedback from our content committee and contributors.

While abstinence and delaying the use of cannabis have been framed as harm reduction tools for young people, these may not be realistic for all youth and are somewhat out of alignment with the outlined definition of harm reduction. The harm reduction strategies below can arm young people with some practical tips to mitigate or reduce the potential harms associated with cannabis use, and need not be mutually exclusive from encouraging young people to wait as long as possible to initiate cannabis use.

1. Start low and go slow

"Start low and go slow" refers to always beginning with low doses and waiting for the felt effects before consuming more. If someone has never used cannabis before, the effect may be stronger than for those who are occasional or frequent users of cannabis. Additionally, this applies to other cannabis products, particularly food products such as edibles, where an individual may have to wait up to one hour (or more) for the felt effects. Consuming too much cannabis can be uncomfortable and unpleasant, and may elevate feelings of anxiety. If this does happen, it could be helpful to stay hydrated, eat some food, and/or sleep it off.

2. Consider appropriate time and place

It is important to exercise judgment around where and when it is appropriate to use cannabis, which can help us think about what responsible cannabis use looks like. For example, using cannabis before school or work might impede on responsibilities, make one less attentive, and it may make short-term recall more difficult. It can be important to also be aware of one's setting and whether it's appropriate to use cannabis there.

3. Choose less risky cannabis products

If youth do choose to use cannabis, being aware of what products they are using and choosing lower risk products can help mitigate potential discomfort or harm. Avoiding high potency cannabis products, such as cannabis extracts, can help reduce harms, and using products that contain CBD has been shown to counteract some of the psychoactive effects of THC.

4. Choose safer methods of cannabis consumption

Smoking is the most common method of use among people who use cannabis. Smoking cannabis, which combusts and burns the plant material, poses more health risks to the respiratory system than other modes of administration. Safer methods can include vaporization, water bongs, or food products, which mitigate some of the risks of smoking. Vaporizing, for example, avoids many of the harsh chemicals found in combusted plant product.

Additionally, individuals may use a variety of materials to consume cannabis, such as aluminum pop cans, plastic bottles, and aluminum foil – and when heated, these materials can give off harmful chemicals. It's important to consider that the actual materials or equipment used to smoke cannabis can also be harmful.

5. Utilize safer smoking practices

This can include avoiding things like deep inhalation or holding in the cannabis smoke as long as possible, which can increase the toxic material absorbed by the lungs and body. A majority of THC in cannabis smoke is absorbed in the first few seconds so holding one's breath does not lead to an enhanced effect.[280]

6. Reduce the amount of cannabis used, and how frequently it is used

Using cannabis frequently, such as on a daily basis, demonstrates stronger links to more social and health risks. Encourage using cannabis less frequently, such as on weekends or a couple days a week. Often not captured by these discussions around daily use is the idea that some people may use just a little bit in the evenings before bed, while others may use chronically throughout the day. While using less frequently is a harm reduction strategy, using lower amounts can also be considered harm reduction.

7. Use products derived from the cannabis plant, rather than synthetic cannabis

While not as popular among youth in Canada, synthetic cannabis, commonly called "K2" or "spice," has been shown to lead to severe health issues, and in some cases, death. Simply avoid synthetic cannabis products altogether, and use natural cannabis instead, which is less risky.

8. Stick to just one substance

Encourage youth to avoid mixing cannabis with tobacco, where using tobacco with cannabis can increase the harms of smoking. Smoking tobacco increases the risk of cancer, cardiovascular diseases, and respiratory diseases, among other diseases, and long-term exposure to second hand smoke from tobacco also causes cancer.[281] Additionally, those who smoke both cannabis and tobacco often consume more than those who smoke tobacco or cannabis alone.[282]

Using cannabis with alcohol typically elevates the felt effects of cannabis. If using cannabis, it's best not to also mix substances – using cannabis and alcohol together can lead to increased impairment, dizziness, and vomiting (or what is referred to as "greening out").

9. Have a plan for transportation before using cannabis

Driving impaired by cannabis can increase one's risk of an accident. Recent self-report studies demonstrate that youth acknowledge cannabis as less impairing than alcohol, but the actual risk of impairment is often understated and misunderstood.[283] It is recommended to wait at least six hours (or more) after using cannabis before driving, and also be aware that combining alcohol and cannabis elevates impairment. Always have a plan for transportation before using cannabis (e.g., public transportation, calling a cab, friend, or parent). In addition, individuals should avoid getting in the car with anyone who has used cannabis recently and may be impaired, as well as avoid using cannabis in vehicles.

10. Consider any factors that may elevate risk

Risk profiles and vulnerabilities are important when considering whether to engage in cannabis use. For example, if a young person or a family member has a history of psychosis or substance use disorder, the risk of cannabis-related mental health problems increases.[284] Additionally, pregnant women should consider avoiding non-medical cannabis use because of the potential harms to the developing baby, which are not yet fully understood.

What is a 'substitution effect'?

Some youth have reported using cannabis in lieu of or as a substitution for other, more harmful drugs. However, research is preliminary and growing in cohorts of adults. The idea of substitution – or the conscious choice made by users to use a less harmful drug, "instead of, or in conjunction with, another due to issues such as: perceived safety; level of addiction potential; effectiveness in relieving symptoms; access and level of acceptance".[285] Canadian youth, for example, often frame alcohol as more

harmful than cannabis, cannabis as less impairing, and report replacing alcohol with cannabis,[286] although more research is needed to understand this relationship.

2.4 CANNABIS: A HISTORICAL AND LEGISLATIVE BACKGROUND

LEARNING OUTCOMES

By the end of this section, you will:

1. ***Learn briefly about the history of drug prohibition in Canada, and how it disproportionately targets vulnerable segments of the population, including youth***
2. ***Understand key elements of the Cannabis Act, particularly as it relates to youth***
3. ***Understand the medical cannabis access program in Canada, including the difference between Licensed Producers and cannabis dispensaries***

A BRIEF HISTORY OF CANNABIS AND OTHER DRUG PROHIBITION IN CANADA

While legislation that prohibited alcohol consumption and sales to Indigenous peoples has existed since 1777 in various jurisdictions across Canada, the first federal legislation with alcohol provisions appeared in the 1867 Indian Act in an effort to colonize Indigenous peoples. The act stated Indigenous peoples could only consume alcohol after they were successfully colonized and assimilated as a Canadian citizens.[a] The first specific drug law in Canada, the *Opium Act* of 1908 and subsequent changes in 1911 (which created harsher penalties for offenders), is acknowledged as a response to the labour shortage on the west coast and the Chinese populations that came to Canada to work on the North American railway. Since opium use was popular among the Chinese populations, the enforcement of the *Opium Act* represented, "a close link between the escalation of anti-drug policies and the public's fear of Chinese immigrants."[287]

Cannabis was added to the list of prohibited drugs in the *Opium and Drug Act* in 1923. Unlike other narcotic drugs, which were federally regulated at the time, "marijuana was added to the Schedule [of Prohibited Substances] before it came to be defined as a social problem in Canada."[288] At this time, cannabis use was not widespread, and the first arrest for a cannabis-related crime was not made until many years later. Since then, the prohibition of cannabis has led to a profitable criminal market as well as links to violence, unsafe street drugs, and a declining respect for government and the police.[289]

Drug policy in Canada has traditionally focused on policing and prisons rather than social well-being and treatment.[290] In fact, by 2008, over 70% of funding for Canada's national drug strategy was being funneled into law enforcement rather than increased substance use treatment, education, and prevention.[291] Prior to legalization, Canada spent roughly $1 billion dollars per year to enforce cannabis prohibition.[292] It is acknowledged that the legalization of cannabis is a matter of social justice, where the prohibition of cannabis led to high levels of inequity in policing as racialized minorities have a much higher chance of being arrested and prosecuted for cannabis related possession,[293] despite little to no difference in usage rates. Black communities in Canada are often the target of policing drug policies more broadly,[294] leading to racialized mass incarceration. For example, from 2010 to 2011 Black inmates accounted for 9% of the federal inmate population, yet only comprise 2.5% of the overall population.[295] Further, youth and young adults have been disproportionate targets of cannabis related arrests, over 80% related to possession alone,[296] which is further exaggerated for at-risk and racialized minority youth. Cannabis prohibition has traditionally affected the most disenfranchised segments, such as those from lower socioeconomic backgrounds, youth, and racialized populations.

THE CANNABIS ACT

On April 13, 2017, the Liberal government tabled legislation to "create a strict legal framework for controlling the production, distribution, sale, and possession of cannabis in Canada." Also known as Bill C-45, *An Act respecting cannabis and to amend the Controlled Drugs and Substances Act, the Criminal Code and other Acts,* the Cannabis Act was created after consultation with the public and a report by the government-appointed Task Force on Cannabis Legalization and Regulation released in November 2016. The government also tabled *Bill C-46, An Act to amend the Criminal Code (offences relating to conveyances) to make consequential amendments to other Acts*, which focuses on drug-impaired driving and the expansion of police powers for detection and enforcement.

The Cannabis Act has three main priorities including:

i. preventing youth from accessing cannabis;
ii. protecting public health and public safety; and
iii. eliminating the illegal cannabis market through serious criminal penalties for those operating outside the legal framework.

On October 17th, 2018 the Cannabis Act came into effect allowing the legal sale and purchasing of certain recreational cannabis products. On October 17th, 2019 an amendment to Schedule 4 of the Cannabis Act (*classes of cannabis that an authorized person may sell*) was made to expand the range of available products for sale to include edibles, extracts, and topicals. Additional regulatory amendments were made to focus on reducing:

i. the appeal of such products to youth
ii. the risk of accidental consumption, particularly of edible cannabis by youth; and
iii. the risk of overconsumption associated with edible cannabis and cannabis products with a higher concentration of THC.

Though legal, there are still regulations, in part to address some of the above public health concerns, for the amount of cannabis an individual may legally possess and limits on THC content per product (see the following tables). The following tables represent the information around possession and product limits listed on the Government of Canada website, but it is important to note that the listed limits, particularly for products other than dried cannabis, can be confusing and convoluted to apply in practice.

Product type	**Possession limits**
Dried cannabis	30 grams
Fresh cannabis	150 grams **1 gram dried cannabis = 5 grams fresh cannabis*
Edible product	450 grams **1 gram dried cannabis = 15 grams of edible product*
Liquid product	2,100 grams **1 gram dried cannabis = 70 grams of liquid product*

Concentrates (solid or liquid)	7.5 grams **1 gram dried cannabis = 0.25 grams of concentrates*
Cannabis plant seed	30 seeds **1 gram dried cannabis = 1 cannabis plant seed*
Cannabis plant	4 plants per residence

Product type	**THC limit**
Edible cannabis	10 mg THC per package
Cannabis extract (ingesting)	10 mg THC per unit (ie a capsule), 1000 mg THC per package
Cannabis extract (inhaling)	1000 mg THC per package
Cannabis topical	1000 mg of THC per package

Government of Canada[b,c]

In addition to amendments within the Cannabis Act, amendments were also made to the Criminal Records Act. On June 19th, 2019 Bill C-93, *An Act to provide no-cost, expedited record suspensions (pardons) for simple possession of cannabis offences*, was passed. These amendments were an important first step for racialized communities disproportionately affected by the criminalization of cannabis possession. Notably, however, the number of records suspended to-date remains low. Additionally, many experts across policy, criminal, and legal spheres agree pardons do not do enough to address the harms caused by the prohibition of cannabis.

KEY CONSIDERATIONS FOR YOUTH

- Under the Cannabis Act, the federal minimum age of access is 18 years old, although provinces and territories may choose to increase the age of access. Much like alcohol access in Canada, there are differences in age of access for cannabis across provinces and territories, ranging from 18 (in Alberta) to 21(in Quebec) years old.

- In terms of sale and promotion, the Cannabis Act prohibits products that are appealing to youth, including promotion in places that could be seen by young people.

- If an adult (18+) is found giving or selling cannabis to youth or using a young person to commit a cannabis related crime, it may result in a maximum penalty of 14 years in prison. This could impact youth who are the minimum age of access and share cannabis with other youth under the minimum age.

- The Cannabis Act does not apply criminal charges for individuals between the ages of 12 to 17 for possessing or sharing up to **5 grams** of cannabis, but all other youth violations are still subject to the Youth Criminal Justice Act. Non-criminal consequences for up to 5 grams can vary across provinces and territories but can include fines and community service. This reflects the fact that young people have historically and disproportionately been the targets of drug-related arrests, particularly for cannabis possession.

- Bill C-46, the coupled impaired driving legislation, allows for "new and stronger laws to punish more severely those who drive while under the influence of drugs, including cannabis." This includes the establishment of "per se" offenses for THC, which refers to a specific concentration of a substance that assumes a criminal charge when a set cut-off is exceeded. While per se limits for alcohol consumption and driving have been scientifically supported, per se limits in the case of cannabis are highly controversial, as scientific evidence has not established a universal measure of impairment.

ACCESS TO CANNABIS FOR MEDICAL PURPOSES

In 2001 Canada implemented a federal medical cannabis access program that regulates the production and distribution of cannabis to qualified patients. The program, formerly known as "Access to Cannabis for Medical Purposes Regulations" (ACMPR) and now covered under the Cannabis Act, grants Licensed Producers and Sellers the ability to legally produce and distribute controlled amounts of cannabis and cannabis products directly to patients by mail. The only legal way to purchase medical cannabis is to get an authorization (similar to a prescription) from a physician or a nurse practitioner, and submit it directly to a Licensed Seller. People who use for medical purposes can also produce limited personal quantities through a special authorization from their healthcare provider for personal cultivation.

In addition to this legal channel, some medical cannabis consumers choose to access cannabis through the legal non-medical cannabis channels (e.g. a 'recreational' store), or from online medical cannabis dispensaries. Medical cannabis dispensaries are illegal retail and online stores that have been traditionally tolerated by enforcement in some jurisdictions prior to legalization, and that distribute cannabis and a range of cannabis products to individuals outside the regulated model. Immediately after legalization many illegal dispensaries continued to operate, however, more recently law enforcement has conducted nation-wide shutdowns of many dispensaries.[d,e,f]

2.5 ASSESSING POTENTIAL HEALTH HARMS

LEARNING OUTCOMES

By the end of this section, you will:

1. *Differentiate between correlation and causation in research*
2. *Understand common indicators of problematic use*
3. *Understand the impacts of cannabis use on cognition and the developing brain*
4. *Understand the complex relationship between mental health and cannabis use, and the importance of various risk factors*
5. *Understand the long-term physical health implications of cannabis use*
6. *Understand evidence behind the common "gateway" theory*

Correlation versus Causation

It is important to note the difference between **correlation** and **causation**, particularly when considering the evidence around youth cannabis use and health outcomes. Although you have likely heard the phrase, "correlation does not equal causation," interpreting correlational evidence as causal remains one of the most common errors in current cannabis education programs.

Causation refers to a proven "cause and effect," where we know that an exposure causes an outcome, meaning there is a scientifically verified direction of the relationship. This is typically established through rigorous, randomized controlled experiments. Correlation refers to an observed relationship between two variables, which may or may not be causal. Correlational evidence generally signals that more research is needed to establish the direction of the relationship between the two factors of interest, and to rule out the possibility that a third factor is driving the relationship.

WHAT DO WE KNOW ABOUT THE RISKS AND HARMS OF CANNABIS USE?

This section will review the evidence on common understandings of cannabis use and youth health. While the evidence generally relies on correlated outcomes, a cautious approach to cannabis use and its effects on young people is still warranted as research continues to develop and we begin to understand these effects more clearly.

i. Cannabis Use Disorders (CUD)

For most people who use cannabis, cannabis use does not progress to problematic use. As is the case for most psychoactive substances, for some users, cannabis use may progress into a substance use disorder. This is marked by a problematic pattern of use leading to clinically significant impairment or distress, often negatively interfering with the user's health and social obligations.[297] Cannabis use disorder (CUD) refers to a clinical classification of cannabis abuse and/or dependence, and can range from mild to severe depending on the number of criteria met.[298] These criteria fall under the broader domains of impaired control, social impairment, risky behaviour, and physiological adaptation.[i] It should be noted that research has also illustrated limitations of the Diagnostic and Statistical Manual of Mental Disorders (DSM) criteria for CUD when applied to youth, particularly because of the ambiguous criteria for defining and classifying tolerance, withdrawal, and craving, which are important components when considering a diagnosis.[299,300,301]

Diagnosing a CUD

A person who uses cannabis and who meets at least two of the following criteria in a 12-month period would be diagnosed with a CUD, according to the DSM (fifth edition; DSM-V):[302, ii]

1. Cannabis is used in larger amounts or over a longer period of time than initially intended;
2. Cannabis use persists despite desires and/or efforts to cut down or control cannabis use;
3. A substantial amount of time is spent in efforts to procure cannabis, use cannabis, or recover from the effects of cannabis use;
4. Cravings (strong desires or urges) to use cannabis;
5. Major work, school, home obligations fail to be met as a result of recurrent cannabis use;
6. Continued cannabis use despite persistent or recurrent social or interpersonal problems caused or exacerbated by the effects of cannabis;
7. Social, occupational, recreational activities are reduced or dropped altogether as a result of cannabis use;
8. Cannabis is used recurrently in physically hazardous situations;
9. Cannabis is used despite knowledge of a persistent or recurrent physical or psychological problem likely to be a caused by cannabis use;
10. Increased tolerance for cannabis, marked by either a) a need for increased cannabis to achieve intoxication or desired effect, or b) markedly diminished effect with continued use of the same amount of cannabis;
11. Withdrawal upon cessation of cannabis use, marked by either a) the characteristic withdrawal syndrome for cannabis (according to separate criteria in DSM-5), or b) cannabis is taken to relieve or avoid symptoms of withdrawal.

Risk of developing a CUD

While overall cannabis use is on the rise, evidence on the rate and risk factors of developing a CUD remains varied.[iii, iv, v, vi] This is complicated by the change in CUD diagnosis criteria between the DSM-IV to DSM-V in

which abuse and dependence criteria was combined and craving and withdrawal criteria were added. Data from the US National Survey on Drug Use and Health (NSDUH) estimates that 11% of youth (aged 12-17) and 6% of emerging adults (aged 18-25) meet diagnostic criteria for CUD within a year of initiating cannabis.[a] Since the early 2000s an increase in mild CUD has been observed in adults, while rates of moderate and severe CUD remain stable.[iii,iv,v,vi] It is important to note several factors may be influencing rates of increased use and transition to CUD including legalization, increased cannabis potency, and changing public opinion. Earlier onset of cannabis use has consistently been shown to increase the likelihood of developing a CUD.[303,304, iii, vi] For example, data from the US National Survey on Drug Use and Health demonstrates that individuals who initiate cannabis use between the ages of 12 to 18 are 4 to 7 times as likely to develop a CUD compared to first time users aged 22 to 26.[305] Similar findings from the National Epidemiologic Survey on Alcohol and Related Conditions-III showed that individuals who initiated cannabis use at age 15 or below had a two-fold increase in likelihood of transitioning to a CUD, compared to those who initiated use over the age of 20.[iii] Though younger age of initiation is a significant risk, data from the US shows that rates of cannabis use and CUD have decreased in adolescents in recent years.[v,vi] Aside from age of initiation, the risk of developing a CUD can vary according to social, environmental, behavioural, psychological, and genetic factors.[306]

Treatment of CUD

There are currently no pharmacotherapy options that have been approved by a national regulatory authority (e.g., Health Canada) for CUD. However, several psychotherapy models exist ranging from motivational enhancement therapy (MET), cognitive behavioural therapy (CBT), contingency management, supportive-expressive psychotherapy, family and systems interventions, and 12-step programs.[307] A review found MET and CBT to be the most successful models for reducing cannabis use and dependence symptoms in the short-term, but the majority of patients did not achieve complete abstinence.[308] Harm reduction and moderation strategies are increasingly being discussed, given low rates of long-term abstinence with conventional treatment,[309] but have not been formally evaluated.

ii. Cognition and the Developing Brain

Adolescence is an important period for developing brain structures and neurotransmitter systems. The use of a wide variety of substances, including alcohol, during adolescence has been implicated in negative cognitive outcomes such as deficits in memory, attention, or executive function.[310] The relationship between cannabis use and healthy cognitive development is unclear. Results of investigations into differences in brain structure and function between cannabis users and non-users are extremely varied. Deficits are most commonly found in early, heavy cannabis users, but there remains little consensus regarding long-term effects.[vii,viii] The ambiguous findings on brain structure and functional changes following adolescent cannabis use make it difficult to draw definitive conclusions. Although not all adolescents experience harm from regular cannabis use,[311] being at an elevated risk of these potential outcomes may be reason enough to delay age of first initiation, use cannabis less frequently, and consume less potent cannabis (i.e., lower percentage of THC).

Research suggests that a relationship exists between early, heavy adolescent cannabis use and impairments in acute cognition function and mental health.[312, ix] Learning impairments, memory impairments, and co-morbid psychiatric disorders are consistently associated with heavy cannabis use, though seem to resolve after a period of abstinence.[ix] There has yet to be definite conclusions about causality, direction, or magnitude of these associations. This is mostly due to the shortage of current research in these areas[313,314] and is a result of the inherent difficulty in establishing directionality of the relationship between adolescent behaviors and adult health and social outcomes that would affirm a causal association. Studying the effects of persistent cannabis use on the brain is difficult due to the infeasibility of studying this association experimentally. Few cohort studies (i.e., studies that observe a group of people over a period of time, often several years) have been conducted that can inform this discussion. As such, the majority of evidence presented is ambiguous and should be interpreted with caution.

Adolescent endocannabinoid system and brain development

While development of overall brain size occurs in earlier years, specific structural and functional changes that increase cognitive capacity and efficiency take place during adolescence. Many important and necessary brain alterations occur during this critical period of brain development.[315] The endocannabinoid system plays a crucial role in many brain areas, including the prefrontal cortex and limbic system, which are crucial for many cognitive processes including decision making and emotional regulation. While animal studies have shown cannabinoid-exposure-induced alterations to brain development,[x,xi,xii] the evidence is much less developed and consistent in humans. Some studies suggest that prolonged, heavy cannabis use during adolescence may result in disruptions of normal brain maturation and maturing neurotransmitter systems[316, xiii] that take place during this time.[317] This is because during adolescence, the brain becomes more sensitive to cannabinoid receptor interactions and thus may be more susceptible than the adult brain to the effects of cannabis use. These potential alterations may persist for several weeks, but research also suggests that any effects may normalize after three months of abstention.[318]

Brain morphology

A handful of studies have examined the brain volume and density of adolescents who use cannabis. Unfortunately, these studies are limited by their retrospective design, small sample sizes, and failure to consider confounding variables. Regardless, there are reports of brain abnormalities associated with cannabis use, such as decreased brain volume and grey matter density.[319,ix,xiv] However, combined evidence from several larger-scale investigations do not support these findings and show limited to no structural brain differences between adolescent cannabis users and non-users.[xv,xvi,xvii,xviii,xix] In adults who use cannabis, there is also little evidence to support changes in brain density and volume overall.[320] One exception to this is in the hippocampus, where there is some evidence to suggest decreased volume.[xv]

Since few studies have examined the developmental trajectories of the brain in adolescents who use cannabis, the impacts of cannabis on the adolescent brain are not yet well characterized. A recent longitudinal study of heavy adolescent cannabis users noted no changes following an average of five years of near daily cannabis smoking.[319] However, there does appear to be some evidence from longitudinal studies suggesting altered white matter development in adolescent and young adult cannabis users.[xx, xxi] Further research is needed to determine when and for whom cannabis may be associated with changes to brain morphology.

Cognition and cognitive testing

While reviewing the research pertaining to cognition, it is important that we do not conflate cognitive testing with intelligence. The evaluation and classification of "intelligence" is very complex, particularly for neurodivergent individuals, and thus cognitive testing, such as IQ tests, should never be used as a proxy.

A recent investigation comparing the results from 69 different studies concluded that while there may be some reduction in the cognitive function of adolescents and young adults who use cannabis, effects were small and potentially lacking clinical relevance.[vii] In other words, differences, if proved true, may be small enough that they cause no true detriment to the individual. Further, if abstinent for longer than 72 hours all cognitive deficits associated with cannabis use were diminished.[vii] Several studies have examined IQ specifically among adolescents who use cannabis, and findings are inconsistent.[320,321,322,323] In one study, cannabis use had a negative effect on global IQ, processing speed, and immediate and delayed memory in adolescents that smoked five or more joints per week, but no long-term effects remained following a period of abstinence. Further, no differences in IQ were observed between non-using controls and individuals consuming less than five joints per week.[324] A recent review considering data from both cohort and twin studies reported similar declines in IQ in cannabis users compared to non-users, but authors noted other factors likely impacted results.[viii] There have been studies which reported an association between persistent cannabis use over 20 years and cognitive decline following a year of abstinence,[325] but these have also been scrutinized for not considering other important factors that may have affected the relationship.[326, 327]

To date, it remains unclear if findings attributing cannabis use to deficits in cognitive scores are due to cannabis use directly, or other factors such as genetics, mental health, and environmental factors. Several studies suggest that adolescent cannabis use is not associated with reduced IQ or educational attainment once adjusting for confounding factors (e.g., sociodemographic factors, other substance use).[328] Rather, evidence suggests that IQ declines may be attributable to family considerations that affect youth rather than the direct result of cannabis use.[329,330] A recent investigation using a twin study found that the twin with higher cannabis use rarely had lower cognitive scores than their cannabis non-using counterpart.[xxii] The twin study design allowed researchers to control for genetic and environmental factors to better assess a causal association between cannabis use and cognitive function. This more strongly suggests that decreases in intelligence and cognition are not directly attributable to cannabis use.

Two factors that appear to be potential mediators of cognitive effects due to cannabis are frequency and magnitude of cannabis use. Research has shown increased frequency and magnitude of cannabis use was associated with worse performance on neuropsychological tests.[331] Further, there was an association between age of initiation and cognitive deficits; adolescents that initiated cannabis use before the age of 15 had lower scores on cognitive tests than those who initiated use after the age of 15.[332]

Educational attainment

Research has broadly suggested that cannabis use in adolescence is linked with lower educational attainment,[333,334,335,336,337] and it has been suggested that rates of educational attainment were highest for those who had not used cannabis by age 18, and lowest for those who first used cannabis before age 15.[338] However, more recent cohort studies found that after adjusting for childhood behavioural problems, childhood depressive symptoms, other substance use (including use of cigarettes and alcohol), and maternal use of cannabis during pregnancy, cannabis use by age 15 did not predict poorer educational performance.[339]

iii. Mental Health

Debate exists in the research literature as to whether cannabis creates harm related to mental health, exacerbates existing issues, or whether the supposed negative consequences of cannabis use can be partially or wholly accounted for by other variables.[340,341] Cannabis use may exacerbate issues in adolescents predisposed to psychosis or schizophrenia.[342] An association exists between cannabis use and an increased risk of developing a depression or anxiety disorder.[343,344] Similarly, an association has been found between cannabis use and increased risk for suicide in adolescents. However, the relationship between genetics and the environment has not been parsed apart.[345]

The extent to which cannabis plays a causal role in the development of mental health issues has yet to be established. The longitudinal studies of cannabis and IQ have highlighted how confounding variables (e.g., sociodemographic factors, polysubstance use) may obscure the actual relationship. Reverse causation must be considered when reviewing the evidence; it may be that adolescents initiate cannabis use to alleviate early symptoms.[346]

Psychosis / schizophrenia

Despite a dramatic increase in the prevalence of cannabis use over the last decade, the population rates of schizophrenia have remained consistent.[347] Evidence supports that the overall risk of developing psychosis / schizophrenia due to cannabis use is low. [354,355,xxiii,xxiv] Further, it appears that risk is largely driven by higher THC potency, frequency of use, early age of onset, and genetic pre-dispositions.[354,355,xxiii,xxiv] Recent findings revealed a directional relationship between individuals genetically pre-disposed to schizophrenia and an increased likelihood of cannabis use, suggesting a strong genetic component.[xxiii] Nevertheless, an association

between cannabis use and schizophrenia does exist.[348,349,350] A recent review concluded that the early initiation of cannabis use was associated with an increased risk of early onset psychotic disorder, especially for those with a pre-existing vulnerability and those who use cannabis daily.[351] A robust systematic review concluded that heavy and/or daily adolescent cannabis use was associated with increased symptoms of psychosis more so than was occasional or non-use of cannabis.[352] Similarly, evidence suggests that regular, early cannabis use in males may increase the risk of enduring subclinical psychotic symptoms, paranoia, and visual hallucinations.[353,354]

Depression / anxiety

Mental health concerns and substance use often first arise in adolescence. The manifestation of anxiety and depression may not be perpetuated by concurrent cannabis use but rather, might arise during a similar developmental period.[355] Nevertheless, epidemiological research in this area suggests that there is an association between cannabis use in adolescence and the development of anxiety[356,357] and depressive mood disorders as an adult.[358,359,360,361]

Evidence remains varied, though some studies report no association, while other studies have found low to moderate rates of cannabis-related harms that were unaffected by age. The most frequently self-reported cannabis-related harm among participants is anxiety or depression.[362] A recent large-scale meta-analysis including 23,317 individuals, found cannabis use in adolescence was associated with an increased risk of major depression as a young adult, even without premorbid conditions.[xxv] No association was found for anxiety. However, there appears to be a dose-response (e.g., small amounts may have little to no significant effect, whereas larger amounts during use can be more harmful) relationship between cannabis use and anxiety,[363] demonstrating that age of initiation and severity of use are important determinants of risk.[364, 365,366]

Self-harm / suicide

There is evidence for an association between exposure to cannabis and an increased risk of suicide in adolescence.[367,368,369,xxv] Several prominent reviews and meta-analyses, spanning over 30,000 individuals and five countries, found an increased risk for suicidal ideation as an adult among those who used cannabis in adolescence. While authors noted several methodological shortcomings with the studies that they analyzed, they suggested that the association between adolescent cannabis use and suicidality should not be ignored.[370]

In a cross-sectional study that examined twin pairs, where twins differed by if they did or did not use cannabis in adolescence, twins who were dependent on cannabis experienced increased odds (2.5 to 2.9 times higher) of suicidal ideation or suicide attempt than their cannabis non-using twin.[371] As environmental upbringing and genetic factors were controlled for through the twin design, the authors could not rule out cannabis as a possible risk factor for suicidal thoughts and behaviour. The research to date points towards an association between adolescent cannabis use and an increased risk of suicide later in life. However, the direction of this association requires rigorous testing through longitudinal research.[372]

Comorbid substance use

Early and heavy adolescent onset of cannabis use has been associated with enduring mental health problems and advancement to other substance use.[373] Even for late onset and occasional cannabis use, the risk of progressing to other substance use and misuse remains higher compared to those who have never used cannabis.[374] While cannabis users appear to be at a higher risk for other illicit drug use, large-scale longitudinal data found that after controlling for other factors (e.g., other drug use, economic deprivation, serious family tension) there was no independent association between cannabis use and subsequent substance use disorders.[xxvi]

Additionally, preventing transitions from cannabis to higher-risk drug use is important during adolescence, as youth who initiate substance use are more vulnerable than older adults to developing substance use disorders.[375] Cannabis use tends to correlate with other high-risk substance use patterns, and is often one of the first initiated substances (after alcohol and tobacco) along trajectories towards higher-risk use,[376,377,378] fueling questions about the potential role of cannabis in determining future patterns of higher-risk substance use.

The "Gateway" Theory

Initially proposed in the 1970's by epidemiologists who were studying youth substance use, the gateway theory suggests that substance use follows a pattern of increasing severity, starting with tobacco or alcohol, progressing to cannabis, and then to other illegal drugs including cocaine, methamphetamine, and heroin.[379]

While people who use cannabis (particularly those who start early or are heavy/regular users) have an higher risk of trying other illegal drugs compared to non-users,[380,381] it is important to note that the majority of people who use cannabis do not transition to other illegal drugs.[382] Furthermore, whether or not cannabis is an initiator is a highly debated topic that has not been fully substantiated.[383] Several plausible causal and non-causal explanations have been proposed to explain (or partially explain) the association between cannabis and transitions to higher-risk drug use, as described below.

Pharmacological Pathways: Cannabis acts on the same reward centre-stimulating neural pathways as nicotine, opioids, and cocaine in the brain. Under a causal framework, the gateway hypothesis proposes that cannabis (and other drugs such as tobacco and alcohol) leads to higher-risk substance use by inducing pharmacological changes in the brain that encourage people to seek the euphoric effects of other drugs (by reducing the reaction to dopamine).[384]

Common Underlying Factors: Rather than cannabis "priming the brain" for other illegal drug use, another potential explanation is that other genetic, environmental, and behavioural factors increase the likelihood of people using substances more generally, with opportunities to use cannabis often coming before opportunities to use other illegal drugs.[385] Many studies demonstrate that these factors explain part of the association, but not all of it.

Contextual Influences: Being exposed to other illegal drugs through different social environments that accompany the use of cannabis has been proposed as another way to explain the relationship between cannabis use and future higher-risk drug use.[386] Since cannabis is an illegal drug in most settings, youth who use cannabis may come into contact with the illegal drug market, which may facilitate opportunities to engage in other illegal substance use.[387,388]

iv. Physical Health

Cannabis use may have short- and long-term physical health implications for some individuals. This section will summarize evidence on the potential physical health impacts of cannabis use with a special focus, wherever possible, on youth. It is important to note that there have been no reported deaths from teenagers or adults overdosing on cannabis,[389] suggesting the harm profile of cannabis is less risky than that of many other common drugs, including alcohol.

Respiratory symptoms

Similar to tobacco smoke, cannabis smoke contains harmful chemicals that can cause irritation and damage to the airway, resulting in a range of respiratory symptoms including coughing, wheezing, shortness of breath,

sputum production, chest tightness, and exacerbation of asthma symptoms.[390] Even after controlling for the effects of cigarette smoking, the estimated risk of chronic cough, chronic phlegm, and wheezing for people who use cannabis is 2 to 3 times that of non-users.[391] There is some evidence that symptoms may improve or resolve after cessation of cannabis smoking.[392]

Lung injury and disease

Relative to non-smokers, cannabis smoking is associated with an increased risk of chronic bronchitis.[393] To date, a consistent association has not been found between moderate cannabis use and/or low cumulative use and risk of chronic obstructive pulmonary disease (COPD) development.[394] There is preliminary evidence that heavy cannabis use may be associated with airway obstruction,[395] and one study found that cannabis use among tobacco users increased the risk of COPD more than twice as much as tobacco-only users.[396]

Recently, there has been a large increase in e-cigarette use, also called vaping, particularly in youth. Use of these products, obtained from illicit sources, has been linked to severe respiratory disease known as E-cigarette or Vaping Product Use-Associated Lung Injury (EVALI).[xxvi,xxvii] While vaping often appeals to younger users, excessive use and/or use of illicit products can lead to hospitalization and in severe cases, death. It is important to note lung damage has not been attributed to cannabis itself but rather from the chemicals and contaminants in the solvent (juice), such as Vitamin E acetate.[xxvi] The long term impacts of EVALI remain unknown.

Lung cancer

Cannabis smoke contains many of the same carcinogenic exposures as tobacco smoke,[397] but the evidence of a causal relationship between cannabis and lung cancer remains inconclusive. One study pooled six case control studies from North America, Europe, and New Zealand and did not find evidence of a dose-dependent association between frequency or duration of cannabis and incidence of lung cancer.[398] However, a study examining the relationship between cannabis use and lung cancer in a cohort of Swedish men observed that the likelihood of lung cancer increased for men who reported using cannabis more than 50 times.[399] Another study found an increase in lung cancer risk based on a pooled case-control study of men in Tunisia, Morocco, and Algeria.[400] A widespread limitation of these studies is the possibility of incomplete adjustment for the effects of tobacco, given that smoking tobacco is common among people who use cannabis[401] and an indisputable risk factor for lung cancer.

Acute cardiovascular problems

Cannabis may cause acute cardiovascular effects such as increased heart rate and changes to blood pressure.[418] There are several cases of acute cardiovascular complications following cannabis use, including several reports among younger males (20 to 40 years old).[402]

Coronary heart disease

Recent findings from the Coronary Artery Development in Young Adults (CARDIA) study demonstrate no dose-dependent relationship between cannabis use and incidence of coronary heart disease.[403]

Stroke

Cross-sectional population-based surveys[404] and assessments of hospitalized patients[405,406] have linked cannabis use to an increased likelihood of ischemic stroke (i.e., deprivation caused by lack of oxygen and other nutrients to the brain). Recent findings showed young cannabis users had 1.82 times the odds of experiencing a stroke compared to non-users, and this increased to 2.45 times in frequent users.[xxvii] However, these findings are contested by a number of other studies.[407,408,409] Evidence remains inconclusive, with limited high quality evidence supporting the association between cannabis use and risk of stroke.[418]

Myocardial infarction and cardiovascular mortality

Several studies identify cannabis use as a potential trigger for myocardial infarction, including among adolescents and young adults.[410] However, an extensive review found no evidence to support or refute an association between chronic cannabis use and future acute myocardial infarction.[411]

Although a recent mortality follow-up study linked cannabis use with an increase in death from hypertension,[412] the CARDIA study did not find cumulative cannabis use to be associated with cardiovascular mortality among middle-aged Americans.[413]

v. Injury

Experimental studies show that consumption of cannabis (specifically THC) induces dose-dependent psychomotor and neurocognitive impairments that affect information processing (e.g., attention and short-term memory), reaction time, perceptual-motor coordination, and motor performance.[414] These impairments may reduce the ability to perform everyday tasks safely, leading to an elevated risk of accident or injury.

Motor vehicle crashes

Controlled experimental studies using a driving simulator have shown that cannabis impairment is associated with altered driving patterns. After using cannabis, drivers tended to exhibit slower speeds, maintain longer following distances, and demonstrate slower reaction times compared to individuals who took placebo cannabis (0 mg/mL THC).[415,416] The most recent and comprehensive review to date estimated that, after controlling for the effect of alcohol, cannabis use is associated with an 18% increase in risk of a motor vehicle crash. The study authors concluded that this increased risk is similar in magnitude to driving with a blood alcohol concentration (BAC) of 0.04-0.05%.[417] Several recent studies support a moderate increase in crash risk after cannabis use.[xxix,xxx] The level of impairment and risk of unsafe driving is estimated to increase if cannabis and alcohol are used together or in close temporal proximity, even at low doses.[418,419] The individual risk for young people who use cannabis may also vary according to other factors such as the driver's gender, experience level,[420] and tendency to drive recklessly.[421]

Occupational injuries

Although several studies among adult workers have not found an elevated likelihood of occupational injury associated with cannabis use,[422,423,424] one study found that working high school students in Texas who used cannabis at least once in the last month were more likely to report an occupational injury than those who did not report past-month cannabis use,[425] although, the study did not discern between time of cannabis use and occupational injury. More recent systematic reviews support the position that cannabis users are not at a higher risk for occupational injury.[xxxi]

Other accidents and injuries

A few studies have assessed the association between cannabis use and injuries more generally, and findings vary considerably. For example, one study found that cannabis use was associated with an increased frequency of injuries,[426] while another did not find an increased risk of injury associated with cannabis use among patients presenting to the emergency department (ED) in British Columbia.[427] In contrast, a Swiss study of patients presenting to the ED found that cannabis use was associated with a 67% decrease in the risk of injury overall, and the risk of injury decreased with increasing doses of cannabis.[428] Common cannabis-related ED visits were shown to be acute intoxication, gastro-intestinal effects, psychiatric effects, and acute physical injury.[xxxii] However, cannabis-related injuries remain rare.[xxxiii] Burns are an emerging cannabis-related health concern: one study noted that the proportion of people who use cannabis within the burn patient population is outgrowing the representation of people who use cannabis in the general population,[429]

and another study recorded an increase in burns from butane hash oil (a potent cannabis concentrate, colloquially known as “dabs”) in Colorado after medical cannabis legalization.[430]

All-cause mortality

While a modest association between heavy cannabis use and all-cause mortality has been identified in one study,[431] this finding was not replicated in two other studies.[432,433] An extensive review concluded a lack of evidence to confirm or refute an association between cannabis use and all-cause mortality.[434]

CONCLUSION

The legalization and regulation of non-medical cannabis markets presents a significant opportunity to change the way we approach cannabis education with young people in Canada. This toolkit has provided a summary of vast amounts of information around cannabis and youth, including ten principles for cannabis education and a pull away curriculum that educators and parents can draw upon as needed. These changes are an opportunity to move away from abstinence-only cannabis education and to develop new approaches that resonate with young people. Key to these approaches will be the creation of programs that serve youth who do not use cannabis, as well as those who do. In any drug education program, young people's right to education and health services, as well as privacy, should be respected.

Educators and parents also need support. This toolkit begins from the ground up, acknowledging that there is no secret recipe for cannabis education. Here are some final key points that summarize and tie together our approach to youth cannabis education:

'Youth' encompasses a large, diverse group of people: Age, gender, socio-economic status, race or ethnicity, community norms, sexual orientation, and attitudes towards cannabis use mean different components of personal and social identity may lead to reduced or exacerbated vulnerabilities, understandings, and use patterns – education should reflect these differences.

Abstinence-only or fear-based approaches do not work and leave many youth in the dark: We need to stop relying on and start rebranding programs that are rooted in this approach, and create education that serves both non-users and users.

Engage youth and do not leave youth out of the process: Give young people the opportunity to talk about their experiences with cannabis. Engage with youth respectfully and acknowledge their capacity to make decisions for themselves. Provide opportunities for youth to be involved in creating, assisting, or leading cannabis education where appropriate.

ADDITIONAL RESOURCES

Practical Guides and Resources

Cannabis and Youth: A Certificate for Youth Workers (free)
https://youthrex.com/cannabis-and-youth-certificate/

Cannabis Use and Youth: A Parent's Guide, HereToHelp BC
http://www.heretohelp.bc.ca/workbook/cannabis-use-and-youth-a-parents-guide

Cycles (a film-based teaching resource), UBC School of Nursing
https://www.uvic.ca/research/centres/cisur/publications/helping-schools/cycles/index.php

Lower Risk Cannabis Use Guidelines, CRISM
http://crismontario.ca/research-projects/lower-risk-cannabis-use-guidelines

Factsheet for Parents and Caregivers, SACY
https://www.vsb.bc.ca/Student_Support/Safe_Caring/SACY_Substance_Use_Health_Promotion/Cannabis-Corner/Documents/sbfile/181002/parents.pdf

Reports

"The Health Effects of Cannabis and Cannabinoids: Current State of Evidence", National Academies of Science, Engineering and Medicine
https://www.nap.edu/read/24625/chapter/1

"Using Evidence to Talk about Cannabis", International Centre for Science in Drug Policy
http://www.icsdp.org/cannabis_claims_reports

"Canadian Youth Perceptions on Cannabis", Canadian Centre on Substance Use and Abuse
http://www.ccsa.ca/Resource%20Library/CCSA-Canadian-Youth-Perceptions-on-Cannabis-Report-2017-en.pdf

Youth Harm Reduction Resources

Karmik *(Vancouver, BC)*
http://www.karmik.ca/

TRIP! Project *(Toronto, ON)*
http://www.tripproject.ca/trip/

GRIP *(Montreal, ON)*
https://grip-prevention.ca/

Legislative

Introduction to the Cannabis Act, Government of Canada
https://www.canada.ca/en/services/health/campaigns/introduction-cannabis-act-questions-answers.html

Backgrounder: The Cannabis Act, Government of Canada
http://www.justice.gc.ca/eng/cj-jp/marijuana/c45/c45.pdf

Cannabis in the Provinces and Territories
https://www.canada.ca/en/health-canada/services/drugs-medication/cannabis/laws-regulations/provinces-territories.html

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