Treating Adult Depression with Cannabis

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The well-known euphoric effects of cannabis and its ability to enhance feelings of wellness (Volkow et al., 2017, p. 285) make it a logical herbal choice in treating depression. In fact, according to Backes (2017), when questioned why they use medical cannabis, "as many as one-third of patients say it is for depression. Also, patients who cite anxiety, stress, or insomnia as primary reasons for using medical cannabis, often identify depression as a secondary reason" (p. 207).

Logic and evidence do not always go hand-in hand, however. There is a large amount of evidence linking heavy cannabis use to major depressive disorder (MDD), and a paucity of research investigating cannabis as a treatment for depression, despite the large number of patients who are using it for that reason. As an example, a 2017 literature review of randomized controlled trials on human subjects only cited a single study of 8 patients from 1973 investigating oral THC for depression (Noel, 2017, p.34).

This paper explores possible causes of depression, current research on cannabis and its two dominant cannabinoids (delta-9-tetrahydrocannabinol [Δ^9-THC, hereafter in this review simply referred to as THC] and cannabidiol [CBD]) as treatment for adult depression. It concludes with a sample nurse coaching care plan for a depressed adult client choosing to incorporate medical cannabis into their treatment plan in the state of Maryland, USA. For the sake of clarity, the term "patients" refers to people under medical care and/or licensed medical cannabis patients, whilst "clients" refers to those participating in a coaching program, since a medical doctor does not always oversee nurse coaching sessions.

Depression is a mood disorder characterized by sadness, apathy, and anhedonia (inability to experience pleasure). Clinical depression is frequently diagnosed by a score of 10 or higher on

the Patient Health Questionnaire-9 (PHQ-9) screening tool. Lower scores can indicate mild depression or dysthymia (chronic, low-grade depression), while scores over 10 indicate a high probability of major depressive disorder (MDD) (Levis et al., 2019). Current medical treatment typically involves long-term use of antidepressant medications, which increase suicide risk (Khan et al., 2018; Hayes et al., 2019) and have other undesirable side effects, so it's possible patients are turning to cannabis as a more natural, plant-based treatment.

Causes of Depression

Depression is a complex condition with different causes necessitating divergent courses of treatment; therefore it is worth taking time to understand possible causes before reviewing treatment options. At this time, there is no conclusive or universally accepted theory of depression, be it psychological, physiological, or other. Current theorized causes include: decreased hippocampal neurogenesis, neurotransmitter signaling malfunctions, genetic vulnerabilities, problematic epigenetic changes, lack of resilience and/or poor coping skills, unresolved losses and trauma, concurrent medical problems, side effects of certain medications (Harvard Health Publishing, 2019), and endocannabinoid system (ECS) imbalances or dysregulation (Bluett et al., 2014; Mangieri & Piomelli, 2007). The biopsychosocial theory of depression states that depression has three types of causation: biological, psychological, and social (Hari, 2018, Ch. 4.), which interact in unique ways within each patient.

Depression Secondary to Medical Diagnoses

Healthcare providers frequently encounter depression secondary to functional and/or ego (identity) changes resulting from illness, disability, or other change in how a patient perceives themself (such as an elderly patient who no longer feels useful or productive). Depression and chronic pain are found together in as much as 80% of cases (Fitzgibbon et al., 2015) and any

database search of medical literature will show there has been research on depression as a comorbidity of myriad diagnoses.

The ECS and Depression

Research into the endocannabinoid system (ECS) has shown that when anandamide (AEA) reuptake is inhibited, stress-coping and mood-related behaviors improve (Mangieri & Piomelli, 2007). While the exact mechanisms are still unknown, it is scientifically accepted that the endocannabinoid system plays a role in regulating both mood and one's experience of pain. Fitzgibbon et al. (2016) have proposed that the ECS may even act as a link between depression and pain, which often occur together as comorbid conditions. If the ECS plays a role in depression, it stands to reason that cannabinoids could have a role in treating it.

Measurable changes in the brain and the endocannabinoid system give clear evidence that depression has physiological characteristics (Scherma et al., 2018). What is unclear is the direction of the association: whether physical changes cause mood changes or the condition of depression causes one's physiology to change. This author believes it to be the latter, but without sufficient evidence, that is simply theoretical.

Biopsychosocial Model

In *Lost Connections*, social sciences researcher and journalist Johann Hari (2018) suggests depression is a rational response to something gone wrong in one's life. By reviewing current evidence and interviewing a large number of researchers, Hari identified seven different causes of depression: lack of meaning and/or purpose in one's work, loneliness, junk values (i.e. materialism as a substitute for interpersonal connections), childhood trauma, loss of status and respect (or low status in one's sociocultural hierarchy), being disconnected from nature, and hopelessness about the future. He considered the brain changes that occur in depressed patients,

but rather than view them as causative, Hari concluded that these changes are due to neuroplasticity: the brain's ability to change and develop (akin to the way muscles grow when one exercises and atrophy when one doesn't). He did identify the one known genetic link to depression; a certain gene variant of 5-HTT can predispose people to depression (Hari, 2018, p. 181). However, as is known from the field of epigenetics, a genetic predisposition does not guarantee one will get the related disorder.

The seven causes identified by Hari are backed up in the scientific literature. With rates of depression on the rise, Lifestyle Medicine (adjusting one's lifestyle to improve mental, emotional, spiritual, and physical health) has been underutilized as a treatment for depression. According to Sarris et al. (2014), "Many of these [problematic lifestyle] factors can potentially be modified, yet they receive little consideration in the contemporary treatment of depression, where medication and psychological intervention remain the first line treatments" (p.1). Unlike mainstream medicine, holistic clinicians tend to promote lifestyle modifications aligned with the biopsychosocial theory of depression since it empowers patients to make small changes with meaningful results. Even low levels of chronic depression (dysthymia) can impact one's daily life in important functional ways (Grunberg et al., 2015), so addressing causes of distress before a patient reaches clinical levels of depression could be very beneficial.

The biopsychosocial model also allows for multiple strategies to be used in patient care. If depression is solely caused by physiologic malfunctioning, the only effective treatment(s) could be physical (i.e. medication, surgery, electroconvulsive therapy, etc.), however, the biopsychosocial approach treats patients as complex beings, which allows for holistic care including: physiologic interventions (medicines, herbs, dietary modifications, exercise, etc.),

psychological interventions (counseling, coaching, meditation, etc.), and social interventions (social prescribing, support groups, animal therapy, etc.).

One of the causes listed above is worth giving additional consideration to: childhood trauma. While childhood trauma may or may not be accompanied by a later diagnosis of post-traumatic stress disorder (PTSD), it may have shared characteristics. In cases where the abuse was not acknowledged or reported, the patient is unlikely to be diagnosed with PTSD, but could be diagnosed with personality or mood disorders years after the traumatic event. It is worth noting that because of their limited developmental understanding, trauma to a child may be as seemingly mundane as feeling unloved because of an event, situation, or rule they did not understand. What is traumatic to a child might not be distressing to an adult with greater experience and understanding, but the implications of unresolved fear, shame, guilt, or anger could manifest in other ways later in life.

Dr. Gabor Maté (Canlio, 2016; Empower the Mind, 2016) posits that it is not the event itself that is traumatic, rather it is the loss of connection to self, truth, or safety we feel after an event that is the actual trauma. This makes sense within a holistic understanding of mind-body-spirit wellness. Maté says a similar thing about addictive substances: if a substance or behavior itself is addictive, then why isn't everyone addicted to them? Some people consume alcohol infrequently, while others can't survive a day without a drink. If the culprit was only the alcohol, we would all agree it's the substance that causes the problem, but if most people can drink without compulsion, there must be more than just a chemical influence in addiction. This theory can be applied in cases of depression resulting from trauma as well; an event that is traumatic to one person might not be traumatizing to another. Beliefs developed in response to trauma can lead to internalized negative emotions with depression manifesting later in life. In these cases,

the depression may appear to have an unknown etiology, especially in cases where the trauma has been denied or repressed.

All of the above theories and potential causes make the combined study of cannabis and depression tricky. As the reader will no doubt see after reading this review, the current evidence provides conflicting data. Therefore clinicians should consider the whole person and use patient interviews along with screening tools to determine the best course of individual treatment. As stated by Sarris et al. (2014), "due to the complexity of human illness/ wellbeing, the time has come for a more integrative approach for depression, and an acknowledgment of the potential applicability of lifestyle modification" (p.9). Lifestyle modifications are often aimed at promoting health and reducing stress. Could cannabis, with its documented euphoric and stress-reducing effects (Cutter et al., 2018), be useful in treating depression or reducing depressive symptoms? That is the fundamental question this review set out to answer. Let's see what the evidence says.

Literature Review

Search Method

To learn what the current research says about using cannabis as a treatment for depression, a database search of PubMed was performed in July 2020 using combinations of the terms "cannabis" "canna*" "marijuana" "treatment" "depression." The search was initially limited to the past five years, with articles published from 2016 through July 2020, but when that turned up inadequate responses, the time criterion was removed. A large number of abstracts were reviewed to determine whether the research was studying cannabis as a treatment for depression (either recommended by healthcare providers or in patients who were self-medicating) and 22 were identified as being potentially relevant to the subject. Reference lists of

included studies were also reviewed to identify additional resources. Articles were excluded that didn't address the question, were not in English, and were not available for free. (The one exception to this final criterion was the 2017 review by Turna et.al, which seemed to directly ask the question this author was trying to answer.) Upon further reading, 11 articles were included in the in-depth review, including one article from 2015, which was out of the preferred date range but was one of the few studies that addressed the question of whether cannabis could be clinically useful for patients with depression. It was also included because it took a dramatically different approach than other identified studies in any date range.

Current Evidence

A 2017 literature review by Turna et al. asked whether cannabis was ready to become a mainstream intervention for certain mental health conditions. Unfortunately, the literature they reviewed on cannabis and major depressive disorder (MDD) dated from 1948, 1973-4, 1996, and 2008. There was no mention of milder forms of depression and they concluded there was insufficient evidence to recommend cannabis as a treatment for mood disorders (including depression), anxiety, and related conditions. Given the increase in cannabis research over the past few decades, this review was decidedly disappointing.

A literature review conducted by Volkow et al. (2017) for the National Institute on Drug Abuse (NIDA) agreed that cannabis had no evidence-based utility in current depression treatments. This is not surprising, since their mandate is studying addiction and the US federal government is notoriously prejudiced against medical cannabis. It should be noted that Volkow has been the Director of NIDA since 2003 (NIDA, n.d.). They based their final assessment on the fact that "As of now, no reported randomized controlled trials have shown benefits of cannabis in anxiety disorders, including PTSD, depression, or addiction" (Volkow et al., 2017, p.298).

While randomized controlled trials (RCTs) are widely considered the gold standard of medical and pharmaceutical research, they are not ideal for complex interventions or studying a large number of variables (such as the wide variety or cannabinoids and terpenes in cannabis). Since the exact chemical constituents (and their proportions) vary depending on growing conditions of each individual plant, herbal medicinals are more difficult to study than pharmaceutical interventions (where every dose is exactly the same). The lack of uniform regulation in cannabis markets (which vary state-to-state) and the documented lack of accuracy in product labeling (Vandrey et al., 2015) make it difficult to account for every variable (as must be done in RCTs). Not only that, but cannabis research has been dramatically limited in the US due to its position as a Schedule 1 drug (Vandrey et al., 2015). With all of those factors negatively impacting cannabis research in the US, it seems unreasonable to expect RCTs to provide the best answers to a subjective experience like depression or a plant-based medication like cannabis with a multiplicity of chemovars (chemovars = chemical variations, the preferred scientific term over 'strains').

A review by Scherma et al. (2018) found mixed results in the efficacy of cannabis for anxiety and mood disorders (including depression). Overall, they concluded the problem was the use of the whole plant in research. CBD and THC can have dramatically different effects, so grouping different chemovars of the cannabis plant all under the heading of "cannabis" would produce conflicting results. This was a general complaint, and did not specifically relate to the studies regarding depressive disorders; some found the effects of THC to be problematic, whilst others found it to be beneficial.

Bahorik et al (2017; 2018) performed secondary analyses on data from a study of 307 Californians that sought to determine if Motivational Interviewing (MI) was an effective

treatment for problematic drug and alcohol use in an outpatient psychiatry setting. Their 2017 article analyzed the "6-month patterns and predictors of marijuana use and its association with recovery for those using (n = 125) and not using marijuana (n = 182)" (p.3) and found that medical cannabis use was associated with poor physical outcomes. Without tracking what patients' medical cannabis use was for though (this data was not collected in the original study), this cannot be reasonably interpreted, since it could be related to progression of the patients' medical conditions. In addition to the poor physical prognosis for medical users, they concluded that patients using (any) cannabis had worse depressive symptoms, functional mental health, and addiction recovery outcomes (which makes sense if those patients continue to use cannabis and cannabis use is equated with a lack of addiction recovery).

In their 2018 analysis, these researchers dug deeper into the data, comparing outcomes from three groups of patients: those who did not use cannabis at all ("non-users"), those using it exclusively for medical use ("medical users"), and those using it for recreational and/or medical use ("non-medical users"). At the initial (baseline) assessment, non-medical users had fewer psychiatry visits, worse mental health functioning, greater symptoms of depression, and more suicidal ideation than non-users. At the one-year follow-up interview, non-medical users showed less improvement across all domains as well. Medical users were shown to have worse physical and mental health functioning initially, but no observable difference at the one-year follow-up. They concluded, "Our overall results support our prediction that the degree to which psychiatry patients with depression have adverse clinical outcomes would be influenced by whether marijuana was used for non-medical or medical purposes" (p.9).

This expectation bias coupled with the fact that the population studied was patients receiving outpatient psychiatry services for the purposes of reducing drug/ alcohol use (i.e. not

the general public) casts doubt over whether these results can be applied more broadly. At no point do the authors address the causes of patients' depression or discuss which appeared first: the depression or the cannabis use. While depression and cannabis use have been shown to co-exist in many studies, one cannot assume which (if either) is to blame for the other. It becomes an endless guessing game, akin to the question of: Which came first—the chicken or the egg? While many studies presume cannabis is to blame, we cannot know for sure without a better understanding of how patients are using cannabis in relation to their depression. It is possible that patients using cannabis as their main coping mechanism (i.e. to escape or numb their pain) could underutilize professional support services resulting in worse outcomes, whilst those using cannabis as a temporary measure to achieve functional improvements/ relief (i.e. as a band-aid) while undergoing a course of therapy might tell a different story. These studies leave that question unanswered.

Fitzgibbon et al. (2015) and Huang et al. (2016) performed literature reviews to study cannabis use in patients with a depression-pain comorbidity. Unlike the Bahorik et al. (2017, 2018) studies, these researchers acknowledged how frequently depression and chronic pain are found in the same population. Neither review specifies their inclusion/ exclusion criteria, but both conclude that the depression-pain comorbidity can be successfully treated with cannabinoids. Huang et al. do not provide specific recommendations since their focus was preclinical research, but state that cannabis was used to treat this same comorbidity in ancient times and, despite the exact mechanisms of action being unknown, "there is considerable evidence involving the endocannabinoid system in eliciting potent effects on neurotransmission, neuroendocrine, and inflammatory processes, which are all known to be deranged in depression and chronic pain" (p. 2902). Fitzgibbon et al. conclude that since Sativex (a prescription spray

with a 1:1 ratio of THC:CBD extracted from the cannabis plant) has proven effective in both reducing chronic pain and elevating mood, a combination of THC and CBD is likely to be beneficial for patients suffering from the depression-pain comorbidity. While these studies are not generalizable to all patients with depression, they do suggest that cannabis-derived medicines could be useful for patients whose depression is a result of their chronic pain.

Zlebnik & Cheer (2016) agreed that CBD should be considered in the treatment of depression, but showed a decided researcher bias against THC in their literature review, denying its medical utility by claiming it is "inherently limit[ed]" (p.4) as a medicinal agent, and "used primarily for recreational purposes" (p.2), while classifying it "similar to most other drugs of abuse" (p.4). Since they do not specify the method or inclusion/ exclusion criteria of their review, readers cannot determine how much (if any) that bias impacted which articles were included, so their conclusion must be viewed with that in mind. In the end, they concluded CBD could be beneficial in treating depression since it stimulates hippocampal neurogenesis, reduces markers of stress in the autonomic nervous system, and decreases behaviors associated with depression and anxiety.

Indeed, CBD's ability to increase hippocampal neurogenesis is significant, as older studies have shown it protects against cannabis-associated (presumably THC-related) decreases in hippocampal volume (Campos et al., 2012). It leaves the critical reader wondering, if patients are using high THC cannabis to self-medicate and don't want to stop, could they simply trade out their high THC cannabis for chemovars with higher CBD content? And if so, what amount of CBD is required for the neuroprotective benefit to outweigh the potential harms? Cannabis prohibition in the early 1900s led to high THC/ low CBD cannabis (Type 1 chemovar) being predominant on the market today (Waldrep, 2018), so it would be interesting to study a variety of

cannabis chemovars and their effects on depression. Unless researchers specify the type of cannabis used by study participants, one can reasonably presume that most of the studies on "marijuana" or "cannabis" (and therefore much of the research linking depression with cannabis use) have been performed with cannabis high in THC and low in CBD. While this does reflect the majority of what is on the market today, it also leaves us with more questions than answers.

In one of the few studies looking at therapeutic cannabis use for depression, Grunberg et al. (2015) asked how Harm Avoidance (HA) as a characteristic of temperament interacted with patients using cannabis to treat anxiety and depression. Temperament is considered a genetically determined bias and therefore a stable aspect of one's personality. HA has been positively associated with anxiety and depression and is "characterized by heightened apprehension, shyness, pessimism, and inhibition of behaviors" (p.3). Results were analyzed and published after collecting two years of data in a three-year prospective longitudinal study of 338 college students.

This appears to be a carefully done study, giving consideration to gender differences and other factors that could potentially impact results. It showcased a different mindset than most of the other literature, since this study was open to the idea that cannabis might be useful in certain situations and for certain types of people with depression, rather than coming from the paradigm of cannabis as a "bad" drug whose use should be discontinued. The researchers were aware that their results might not be generalizable since they used a small age range (18-21 years at study inception), but their sample size was robust and their approach was refreshingly humanistic.

Grunberg and colleagues found students who scored high in HA and reported high cannabis use had fewer anxiety and depression symptoms than those with similar temperaments who did not use cannabis. They concluded, "marijuana's anxiolytic and mood-enhancing effects

(or perceived effects) may attenuate the effects of HA on risk for anxiety and depression, raising the question of whether such effects might motivate individuals high in HA to use marijuana" (p.15). Additionally, they cautioned against blanket policies encouraging students to reduce or discontinue cannabis use, since it might provide important benefits to people whose harm-avoiding temperament predisposes them to anxiety and depression.

Womack et al. (2016) received a NIDA research grant to analyze data from a 20.5-year longitudinal study. They followed 264 young men between 17 and 22 years old to determine causality in the cannabis—depression association. The "cannabis effect" (p.287) theory suggests that heavy cannabis use causes depression, while the "self-medication hypothesis" (p.288) suggests patients are using cannabis to mitigate pre-existing symptoms. Another possible explanation is a bidirectional association, wherein depression encourages cannabis use, which in turn, increases depressive symptoms. (This is more of a loop than strict causality where the instigating factor is likely unknown and irrelevant, since each factor contributes to the other.) The final theory they examined was the "common-factors perspective" (p.288), which posits that cannabis use and depression are not directly related, but share underlying risk factors such as genetic polymorphisms or psychosocial issues. Researchers admitted to limitation in the study design with regard to evaluating the self-medication hypothesis, namely that "self-medication patterns may be better observed in short-term prospective studies rather than studies with assessment points several years apart" (p.295). Overall, this study found evidence was limited for the self-medication hypothesis but supported the cannabis effect, and recommended greater emphasis on efforts to prevent cannabis use or at least to delay initial use among adolescents and emerging adults (ages 18-25).

This conclusion highlights one of the main challenges with this study and the one by Grunberg et al. (2015): both were conducted on adolescents/ young adults, a population where cannabis use is already contraindicated due to ongoing brain development through age 25. It leaves us with the lingering question of whether a fully developed adult brain would be affected the same way. This could be answered by replicating these studies with an older population. If brain development is negatively impacted by cannabis use before age 25 (as currently understood), it would be logical to assume that such use would be related to poorer cognition and mental health overall, including depression. Would these findings be consistent in middle-aged adults? We can't say; none of the research to date has addressed this. Additionally, this study focused on men, but the rates of mental health disorders differs between genders (Grunberg et al., 2015; Womack et al., 2016) negatively impacting its generalizability.

Cutler et al. (2018) did examine gender differences in a naturalistic study using real-time user data from the Strainprint™ smartphone application (app). They analyzed data from 11,953 inhaled cannabis sessions (1,399 different patients) of which 3,151 of the sessions were for depression, 3,717 were for stress, and 5,085 were for anxiety (p.198). While naturalistic studies are less controlled and more observational than RCTs, they excel in documenting phenomena in a real-world setting. This is useful for cannabis research since cannabis preparations vary widely in terms of their chemical constituents (phytocannabinoids and terpenes) and this can be expected to yield a sample more reflective of the current marketplace. In user tracked data, one cannot control for expectancy bias (the user's expectation of whether or not an intervention will work), but depression is frequently diagnosed using subjective factors (such as patient complaints), so it could be that this subject matter is better suited to different research methods than those for strict pharmacological interventions. Medical cannabis products licensed by

Health Canada are prepopulated in the app so, for the most part, data analysis uses lab-verified cannabinoid and terpene content, controlling for user error (or apathy) in terms of data entry.

This study found that overall, medical cannabis users found cannabis useful in relieving symptoms of depression, anxiety, and stress, but users' baseline level of depression increased over time, supporting the theory that cannabis use can contribute to depression. The authors noted that like cannabis, antidepressant medications may also be useful in the short-term but "increase vulnerability to relapse upon discontinuation. Thus, similar to more conventional pharmacological treatments, cannabis may temporarily mask symptoms of negative affect but may not effectively reduce these symptoms in the long-term" (p.204). Their research supported the technique of microdosing (taking a single inhalation multiple times throughout the day) for relief of anxiety and depression symptoms. Conversely, they found stress-reduction typically required larger doses, and that 10+ inhalations were most effective for reducing stress.

Their analysis of cannabinoid content showed that while the ratio of THC:CBD had no impact on efficacy with regard to anxiety symptoms, cannabis with low THC and high CBD content (THC <5.5% : CBD >9.5%) was most effective for depression, while the combination of high THC and high CBD content (THC >26.5% / CBD >11%) was most effective for reducing stress.

Future Directions

The evidence above clearly shows the complicated nature of using cannabis to treat patients with depression. The simple answer is: we do not yet know if cannabis is effective in treating depression. There are certainly significant risks to using it, especially for patients who are not receiving any other interventions or treatments to heal the root causes of their depression. Since patients are already using cannabis to treat symptoms of depression, current best practice

would appear to steer them in the direction of Type 2 or 3 chemovars (type 2 = 1:1 THC:CBD, type 3 = CBD dominant), since the evidence of CBD's neuroprotective benefits is compelling.

An ideal holistic research study in this field would ask the question, "Can cannabis be useful in the treatment of depression?" Its researchers would interview a balanced number of female and male patients aged 26 and older to discover the causes of their depression and use appropriate holistic therapies to work with patients to heal the root cause. In addition to the holistic therapies, patients would be divided into a control group and 3 inhaled cannabis groups (all balanced in terms of gender): one using high THC/ high CBD cannabis, one using low THC/ high CBD cannabis, and one using high THC/ low CBD cannabis. Since there are so many chemovars on the market, it would be interesting to choose 2-3 specific chemovars that fit each category and allow patients to use their preferred option that fits their assigned THC/CBD profile. This would prevent results from being associated with a particular "strain" and allow for greater generalizability since different regions have different available cannabis varietals.

As noted by Cutler et al (2018), inhaled cannabis is the most common in the real-world setting and provides the fastest onset of effects, so it is ideal for measuring symptom results. Patients would need to be taught self-titration and microdosing along with general education about cannabis, depression, and their plan of care. Looking at the associations between causes of depression, choices of therapies, cannabis use, cannabis chemovars, and overall treatment efficacy would be quite interesting and could fill in some of the many research gaps. Once the most effective THC:CBD ratio is determined, it would be interesting to study whether the usage could be split up, such as by having patients use CBD during the day and THC before bedtime since there is "a strong causal link between insomnia and depression" (Sarris et al., 2014, p.6).

Sample Plan of Care for a Depressed Client

Until more research is completed and analyzed, Nurse Coaches should exercise caution when it comes to patients presenting with depression, and keep in mind the ethical principles of respect for the client's autonomy and harm reduction (Bean & Smith, 2016). If a medical cannabis patient believes that cannabis is useful for them and wants to use it, nurse coaches should educate the client on the current evidence and work with them to co-create a plan of care. It is imperative to approach clients in a curious, nonjudgmental, and compassionate manner to establish trust in the therapeutic relationship.

The following is a sample careplan for a patient interested in CannyNurse™ Coaching and cannabis to manage depression. Since the author practices in the State of Maryland, the medical cannabis certification process in Maryland is included for informational purposes. This process varies according to patients' legal jurisdiction, specifically state-by-state in the United States.

While coaching is a highly individualized process, there are several elements that will be common to all clients. These are: the initial assessment, CannyNurse™ coaching sessions, lifestyle medicine strategies (including adjunctive holistic therapies, as desired), cannabis education (including products/ use / dosing strategies), and ongoing evaluation of the process.

Assessing the Depressed Client

As part of the preliminary assessment, clients would be asked to complete the following: the Personal Health Record and Integrative Health and Wellness Assessment (Dossey et al., 2015), the PHQ-9 depression screening (Levis, et al., 2019), and the CannyNurse™ Social History and Lifestyle questionnaire (see Appendix A). These questionnaires plus an in-depth client interview form the basis of each client's initial careplan. Any clients scoring 10 or higher

on the PHQ-9 (Levis et al., 2019) or presenting with suicidal ideation would be advised to also consider working with a psychiatrist or psychologist since overseeing treatment of Major Depressive Disorders and suicidal ideation are out of the scope of nurse coaching. Clients would also receive a written handout with crisis intervention and suicide prevention resources (see Appendix B) that are available 24 hours per day, 7 days per week.

CannyNurse™ Holistic Coaching Process

The CannyNurse™ Holistic Coaching Process (developed by the author) uses Integrative Nurse Coaching (holistic nursing theory, motivational interviewing, appreciative inquiry, reflective practice, mindfulness, etc.), empowering esoteric principles (Hermetics, alchemy, shadow work, biofield therapy/ energetics, mirror theory, mysticism, etc.), and plant medicine (cannabis, essential oils, and flower essences) to help clients find joy, serenity, and wisdom on the spiral path of wellbeing (see Appendix C). Client participation is crucial in developing the plan of care since "Adherence and engagement are increased by having ownership of a treatment plan and a sense of shared partnership in its development and planning" (Sarris et al., 2014, p.8).

Clients typically meet with the CannyNurse™ coach for one hour via phone or secure video chat on a biweekly basis, although session length and frequency may be adjusted based on client preferences. In these sessions, clients are led to set both functional and feeling goals and co-create a plan to achieve those goals in the spirit of gentleness, self-love, and nonjudgment. The nurse coach's role is to guide the client along their journey of self-awareness, reflection, insight, and conscious growth based on the nurse coach's experience, expertise, and current scientific evidence. Clients receive personal and customized education based on their needs, learning styles, and interests. Clients presenting with depression receive a detailed handout with

crisis intervention and suicide prevention hotlines (see Appendix B) plus a range of practical suggestions and strategies to increase feelings of connection and elevate their moods.

Holistic Therapies and Lifestyle Medicine

According to Bluett et al. (2014), "Stress is a major risk factor for the development of mood and anxiety disorders" (p.1), so it is likely that many of the coaching sessions would focus on helping the client find and implement stress-reduction strategies in their daily life. Reducing stress also helps balance the endocannabinoid system. In a systematic review of complementary therapies for depression, Haller et al. (2019) found mindfulness-based cognitive therapy to be more effective than antidepressants in preventing depression relapse, while evidence for other complementary therapies was mixed. This suggests a mindfulness-based approach will likely be effective in the coaching sessions.

Meditation has also been shown to reduce negative affect and increase positive affect (Hofmann et al., 2011; Zeng et al., 2015) more effectively than physical exercise (Alsaraireh & Aloush, 2017) and with greater benefits in terms of developing self-compassion than yoga (Falsafi, 2016). In addition to learning meditation and mindfulness skills within the coaching sessions, clients would be directed to a series of guided mindfulness meditations (a wide variety of which are available for purchase and for free online) to be incorporated into their daily or weekly habits, as desired.

Lifestyle modifications are especially useful when introduced gradually and with the client's willing participation (for example, if a client hates to exercise and loves to sleep, but isn't getting adequate rest, sleep interventions are a better place to start than exercise). While lifestyle medicine is still an emerging field, evidence suggests that the modern Western diet, sedentary high-stress lifestyle, inadequate sleep/ recreation, and social factors such as those

identified by Hari (2018) may all contribute to the rise in depression that has been noted since the 1980s (Sarris et al., 2014). These lifestyle factors are identified through the Integrative Health and Wellness Assessment as well as in coaching sessions by actively listening to what the client does and does not say.

According to Sarris et al. (2014), evidence-based lifestyle modifications to decrease symptoms and occurrences of depression include: switching to a whole foods based diet, decreasing inflammation (via dietary or other factors), increasing exercise and physical activity, utilizing mindfulness and meditation practices, conscious use and possible reduction of nontherapeutic mind-altering substances (such as alcohol and cigarettes), increasing sleep duration and quality, developing positive and supportive social relationships, and removing/ reducing negative relationships (which have been associated with depression). There is emerging data to recommend: balancing one's time spent working/ resting/ playing, listening to music one enjoys, using formal relaxation techniques (guided imagery, progressive muscle relaxation, etc.), spending time and/or exercising in nature, animal/ pet therapy, and reducing time spent on technological devices ("screen time"). Interestingly, some studies showed coffee to be protective against depression, while there may be a link between highly caffeinated energy drinks and depression (again pointing to the benefits of a diet avoiding processed foods and beverages) (Sarris et al., 2014).

At all times, the client is free to choose additional therapies and healing modalities that support their quest for self-actualization. There are a wide variety of options available, but it is important that the coach not overwhelm clients with "to-do" items when they are in an emotionally vulnerable and/or fragile state. In this respect, we follow the mantra that 'slow and steady wins the race.'

Cannabis Education

Obtaining a Medical Card in Maryland

If clients do not already have a medical cannabis card, they can apply for a state medical card on the Maryland Medical Cannabis Commission (MMCC) website (mmcc.maryland.gov). Once they have a state registration number, the patient must visit a state-registered healthcare provider to determine if cannabis is appropriate for them (qualifying conditions, registered providers, and an overview of the process are on the MMCC site). At the appointment, patients should discuss all current medications with the recommending doctor since cannabis can interact with other medications. If certified, patients will receive a temporary authorization at the appointment and be immediately eligible to purchase cannabis in the state-approved dispensary of their choice (Maryland Medical Cannabis Commission, n.d.).

Choosing Cannabis Products

New medical cannabis patients (even those with a history of other cannabis use) should approach medical cannabis use with a spirit of curiosity and patience. Since depression and anxiety can occur any time of day, patients would be well-served to know the smallest possible dose that can help when depressive symptoms occur. This allows the client to microdose (i.e. take tiny doses only as and when needed), which can decrease intoxication effects by only taking the minimum amount required to receive relief (Cutler et al., 2018). For daytime use, Type 2 or 3 (CBD-balanced or CBD-rich) chemovars should be utilized, as CBD helps mitigate the intoxicating effects of THC and has neuroprotective, antidepressant, and anxiolytic benefits (Zlebnik & Cheer, 2016; Campos et al., 2012). Further, Fitzgibbon et al. (2016) have suggested that the combination of THC/CBD therapy may be beneficial for the depression-pain comorbidity.

Since CBD can be stimulating (Russo, 2017), patients could consider THC dominant Type 1 chemovars in cases of insomnia, though lifestyle modifications would preferably be the first course of intervention for sleep disorders since high-THC cannabis could possibly worsen depression. Patients should also be aware that labeling of ratio products is not standardized (i.e. does 2:1 mean two parts CBD to one part THC or vice versa?) and the ratio is not reflective the strength of the product, so labels should be analyzed carefully to determine the appropriate dose.

Patients choosing to use cannabis for mood-enhancing benefits should understand first and foremost that no known substance – cannabis included – can cure depression. Due to the current lack of evidence, at this time cannabis is best utilized as an addition to primary treatments that address the root cause of a client's depression (such as counseling). That said, the temporary uplifting and anxiolytic effects of cannabis could be quite useful in one's daily life. As Grunberg et al. (2015) noted, "subclinical levels of anxiety and depression are associated with meaningful functional impairments" (p.15), so clients living with low levels of depression begin each day with a deficit, rather than 'normal' levels of energy, motivation, and wellness.

Medical Cannabis patients who choose to exclusively use CBD to alleviate symptoms of depression should be aware that all CBD is not equal, and CBD products should still be purchased in a state-regulated dispensary when possible. Industrial hemp is a phytoremediator that has helped clean contaminated soil at sites such as the nuclear waste disaster at Chernobyl (Cole, 2016). This means that when hemp is grown in non-organic or contaminated soil, it could contain heavy metals or other toxins that could have detrimental health effects (O'Connell, 2017). Additionally, many CBD products have inaccurate potencies and misleading claims whether they are sold online (Bonn-Miller et al., 2017) and even in some dispensaries (Vandrey et al., 2015).

Routes of Administration

Patients who are new to cannabis may find inhalation to be the easiest route while adjusting to the euphoric and relaxing effects of cannabis. Instead of smoking, patients should consider a dry flower vaporizer, which is easier to use for microdosing because the plant matter is not lit on fire (and therefore doesn't need to be put out after one puff). That said, for patients who prefer to smoke, it is important to note that smoking cannabis does not have the same risks of lung cancer that smoking tobacco does, though it can have side effects of airway irritation, increased phlegm, and bronchitis (MacCallum& Russo, 2018). Another convenient option for microdosing is concentrate vaporizers ("vape pens"). These (and all other cannabis products) should only be purchased through state-regulated dispensaries where patients can view the Certificate of Analysis (COA) to confirm the quality, purity, and absence of potentially dangerous additives.

Cannabis Dosing Strategy

Cannabis dosing is an individualized process, and patients will need to learn the art and skill of self-titration to find the dose that works best for them. According to MacCallum and Russo (2018), the general rule is to "start low, go slow, and stay low" (p. 13) with daily doses of THC not to exceed 30mg/day to avoid developing tolerance. It should be noted that the 30mg/day guideline was given as a general rule for all uses, and is likely much too high for patients with depression. The importance of using the minimal effective dose is in part due to the well-known biphasic effects of cannabis (Scherma et al., 2018), wherein low doses of THC can be anxiety-relieving while high doses can be anxiety- and even panic-inducing. In the case of depressed clients, this is even more important because of the aforementioned association of high levels of THC with deceased hippocampal neurogenesis.

Ideally, any new cannabis product should be tested on a day and time when the client does not need to drive a car, go to work, or be responsible for someone else's care (a child, elderly parent, etc.). Cannabis naïve clients should initially start with one inhalation, wait 15 minutes and assess their results. This is made easy by using a smartphone app such as Releaf, which tracks cannabis chemovars, dose timing, and effects (Releaf, n.d.). (Canadians should consider the Strainprint app as mentioned in the literature review above.) Additional inhalations should be done 1 at a time, with a minimum of 15 minutes between inhalations to determine the minimal effective dose. Clients should know that euphoria or "feeling high" is not necessary to achieve relief.

For depression, the book *Cannabis Pharmacy* (Backes, 2017) recommends a dose of 2.5 to 5mg THC (inhaled/ sublingual) accompanied by 5 to 10 mg CBD for concurrent anxiety (if present). Oral CBD in a ratio of 10:1 (CBD:THC) or greater could be used without producing euphoria for most patients, provided the last dose of CBD is no later than 5pm due to its stimulating effects.

Potential Adverse Effects and Drug Interactions

Despite being a 'natural' plant-based medicine, overmedication with cannabis can have adverse effects. The most common of these are: drowsiness, dizziness, dry mouth, coughing/ increased phlegm/ bronchitis (smoking only), anxiety, nausea, cognitive and memory effects, euphoria, blurred vision, and headache. Most of these effects are dose-dependent, reinforcing the 'low and slow' mantra. CBD has been shown to mitigate many of these side effects, which reinforces the combination THC/CBD approach mentioned in the dosing strategy above. As with other plant-based medicinals, cannabis can interact with other medications (positively and

negatively), so it is important to discuss all current medications with one's doctor (MacCallum & Russo, 2018).

Safety, Legal, and Ethical Issues

Patients should maintain careful and reasonable safety standards at all times, not only for cannabis, but also for other supplements, medications, and potentially dangerous substances like cleaning supplies. In general, patients should keep all supplements and medications (prescription and over the counter) in a locked container to prevent access by children or diversion to parties for whom the drugs are not prescribed. It is never safe to drive while intoxicated, and cannabis is contraindicated for pregnant/ breastfeeding women (Skelton et al., 2020) and young people under 25 (Shen, 2020). While cannabis is considered safe for many elderly patients, they can be very sensitive to effects of THC; so initial doses should be even lower for those patients (for example, consider starting at 1mg THC, not 2.5mg) (Abuhasira et al., 2018).

Additional care must be taken with regard to cannabis 'edibles.' Unless other routes are contraindicated, the author does not recommend these for patients with dependents in the home, since it would be easy for children, pets, or adults with dementia to mistake these edibles for candy. Because of their deceptive appearance, slow onset, and the conversion of delta-9 THC to 11-hydroxy THC (which is more psychoactive and longer lasting) in the liver, edibles can cause terrifying feelings of sickness and anxiety in patients who take a higher dose than their body needs. For this reason, the author does not recommend oral routes or tinctures for cannabis-naïve clients in Maryland since these currently seem to be primarily oil-based in this state, which means they will not be effective sublingually and will instead follow the oral route of ingestion and first-pass effect in the liver.

Clients should be educated on potential legal issues with using cannabis that could negatively impact their life or livelihood. As long as cannabis remains a Schedule 1 drug, it is federally illegal in the United States. Clients who work for the federal government or have "drug-free workplace" policies need to fully research their own employment policies or risk losing their job (which would most likely lead to greater depression). Additionally, parents dealing with custody issues need to be aware of the potential impact of cannabis use on their parental rights. Finally, while the diagnosis of Cannabis Use Disorder (CUD) makes provisions for medical use, the diagnosis could have lasting effects, as would legal charges such as driving while intoxicated.

Though nurse coaching is based in ethical principles such as respect for autonomy and harm reduction, there is another ethical concern with the use of cannabis in depressed patients, namely that it is easy to use (along with sugar, alcohol, and other mind-altering substances) to numb one's pain rather than feeling the pain fully and dealing with its source(s). Clients should be cautioned to avoid using cannabis as an escape from painful realizations or memories without appropriate therapy or counseling. As a band-aid type solution, cannabis may provide functional relief and improve one's ability to participate in life, work, and relationships, but in the case of depression, should always be accompanied by some form of mental and emotional processing of the root cause(s).

Evaluating the Plan of Care

Since the coaching process includes continuing evaluation, goals and efficacy of plan elements will be discussed at every appointment. Typically, each coaching session begins by asking the client, "How have things been going since our last session?" This open-ended question allows patients to discuss how they have been feeling, what has been working well,

what has been challenging, and to share any new information that may be relevant. Follow-up questions using motivational interviewing and appreciative inquiry techniques give the nurse coach and client the opportunities to continually adjust the plan of care in real time.

Depression is an ongoing condition, so, while clients might never consider themselves fully "healed," most can reach a place of serenity and confidence in their own ability to deal with life's challenges. At this point, coaching sessions could be spread out (i.e. monthly instead of biweekly) or discontinued altogether, depending on the wishes of the client. Clients have the ability to return for continuing support as and when needed.

Conclusion

The contrast between the euphoric effects of cannabis and the lack of research on cannabis for mood elevation in cases of depression is curious. Indeed, the idea that a plant could be the source of such prejudice from the medical establishment that so much of the research focuses on harms rather than therapeutic use is puzzling. Without negating the research associating heavy adolescent cannabis use with early onset of schizophrenia/ psychosis, one must ask whether or not cannabis could be a useful stepping-stone for adult patients working their way towards better mental health.

If one can accept a patient with a situational or transient condition such as postpartum depression using antidepressant medication (with its known risk of suicide) to feel better until she adjusts to her new normal, then why not cannabis to help patients feel better while working to heal the root cause(s) of their depression? (Please note, this author is not advocating breastfeeding mothers use cannabis as that has been shown to pass to the baby through breast milk, and both pregnancy and lactation are contraindicated, as mentioned above.) Clearly, more research is needed on this topic, but it needs to come from a position of true curiosity, without

the stigma and preconception that feeling happy (or euphoric) is an adverse effect of the plant or that patients who want to feel better are ‘drug-seekers’ looking to ‘get high.’ While evaluation of the literature and clinical guidelines on cannabis use and PTSD is outside the scope of this review, it should also be considered in cases of depression resulting from childhood trauma.

There is no substance that will cure mental and emotional pain—though many will numb it—and many people suffering from depression are already using cannabis. Given that the current evidence is mixed, all nurse coaches can do is respect a client’s autonomy to choose cannabis and/or cannabinoids (if recommended by a doctor) and guide them to dosing strategies and choices that are least likely to cause harm: namely microdosing, using CBD-rich and CBD-balanced chemovars during the day, and THC-dominant chemovars as a last resort and/or for sleep. An effective, holistic, and evidence-based nurse coaching careplan requires: critical examination of the cause(s) of a client’s depression (including potential lifestyle factors), client engagement with and co-creation of the plan, holistic coaching sessions (with or without adjunctive therapies and lifestyle modifications), and ongoing client/coach evaluations performed in the spirit of curiosity, compassion, and kindness.

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APPENDIX A: CannyNurse™ Social History and Lifestyle Questionnaire

CannyNurse

Social History & Lifestyle Questionnaire

Client Name _____ Date _____

Have you experienced emotional/ mental/ physical/ sexual abuse, trauma, or violence (either personally or as a witness)? YES_____ NO_____ UNSURE_____

Directions: Place an "X" or "✓" in the box that represents how you've felt in the past month.

	Never	Rarely	Half the Time	Usually	Always
My work is meaningful and I make a positive impact with what I do and/or how I do it.					
I have people I can rely on when I need help or feel down. How many people?_____					
I spend money on things that are important to me and bring me joy (rather than on things designed to impress other people or fill a hole in my life).					
I feel safe and secure in my body, in my home, and in my community.					
Regardless of my bank balances, I feel stable and respected in my professional life.					
I feel connected to the natural world.					
I am excited to see what my future holds.					
I feel calm and content.					
The work I do lacks meaning and purpose.					
I am lonely (whether or not other people are near me) and/or my relationships feel superficial.					
I shop (or eat, drink, gamble, use illicit substances, etc.) compulsively to fill time and/or to make myself feel better in some way.					
I am overly worried/ aware of potential threats to my safety and happiness.					
I worry I cannot overcome the social obstacles (hierarchy, income inequality, etc.) to living the life I really want.					
I avoid being in and/or interacting with nature.					
I can't imagine a better or brighter future.					
I feel ashamed, guilty, and/or humiliated.					
I feel depressed and/or anxious.					

Based on *Lost Connections* by Johann Hari (2018).

APPENDIX B: CannyNurse™ Crisis, Depression, and Suicide-Prevention Resources

CannyNurse *Crisis, Depression, & Suicide-Prevention Resources*

If you are depressed enough that you are considering suicide, please know you are not alone. The following resources are available to you 24 hours a day, 7 days a week.

Crisis Text Line (USA, Canada, UK, & Ireland)

Website: https://www.crisistextline.org/

Phone: *US and Canada:* text 741741
UK: text 85258
Ireland: text 50808

Notes: Text "Home" to any of the above numbers, anytime. Crisis Text Line is here for any crisis. A live, trained Crisis Counselor receives the text and responds, all from our secure online platform. The volunteer Crisis Counselor will help you move from a hot moment to a cool moment.

National Suicide Prevention Hotline (USA)

Website with live chat: https://suicidepreventionlifeline.org/

Phone: 1-800-273-8255 (1-800-273-TALK)

Notes: also has options for Spanish speakers, deaf/ hard-of-hearing

Grassroots (UK)

Website: https://www.prevent-suicide.org.uk/find-help-now/

Phone: varies by organization

Notes: This site compiles a list of several hotlines according to demographics (by age, LGBTQ, etc.). Of special note is the #StayAlive app and more information on that can be found here: https://www.prevent-suicide.org.uk/find-help-now/stay-alive-app/

Additional Online Resources:

- https://themighty.com/suicide-prevention-resources/
- https://www.sprc.org (Suicide Prevention Resource Center)
- https://www.cdc.gov/violenceprevention/suicide/resources.html
- https://www.nimh.nih.gov/health/topics/suicide-prevention/index.shtml

APPENDIX C: CannyNurse™ Spiral Path of WellBEing

The Spiral Path of WellBEing is a visual representation of the philosophy that life is a series of opportunities for growth (represented by an upward spiral). Challenges, problems, and difficulties are opportunities to increase our self-mastery by: (1) being present and aware of things that trigger us emotionally, (2) observing and reflecting on our pain points until we reach a measure of (3) self-understanding and acceptance, allowing us to (4) move forward from a place of greater empowerment. When growth does not occur, we repeat the same cycle until we have mastered that life lesson. We humans are complex beings, so while we may have one main path in the journey of life, as triggers arise, they give us additional spiraling offshoots (like branches of one main tree trunk) from which we can grow and learn.