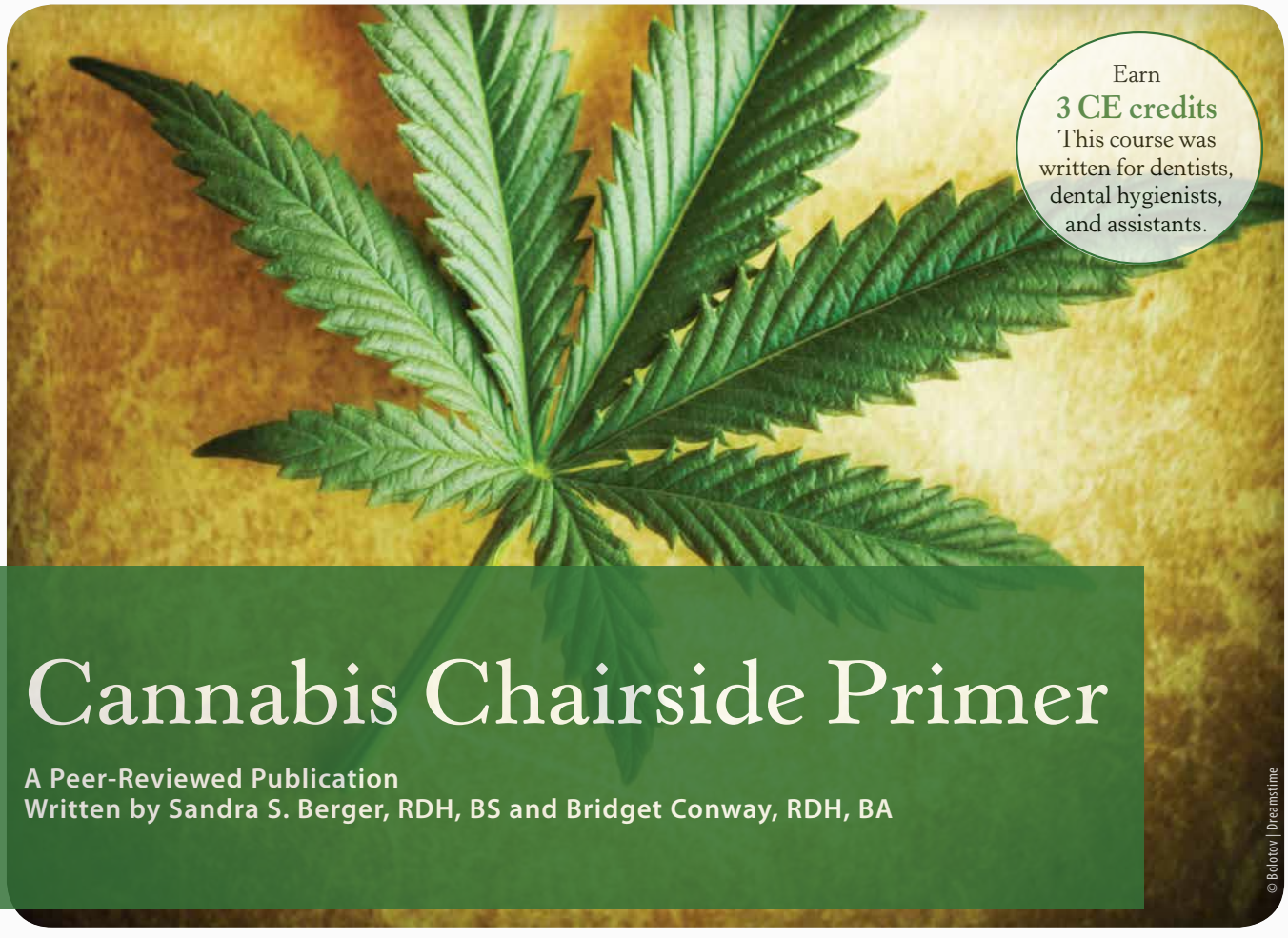

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Cannabis Chairside Primer

A Peer-Reviewed Publication
Written by Sandra S. Berger, RDH, BS and Bridget Conway, RDH, BA

Abstract

Cannabis has been used for therapeutic purposes in Western medicine since the mid-19th century, but it was used as a medicine in Asia, mainly in India, since before the Christian era. In the first decades of the 20th century, cannabis use for medicinal purposes decreased significantly in Western medicine due to the difficulty in obtaining consistent potency results from different batches of plant material. Interest in the medicinal benefits of cannabis was renewed when, in 1965, it became possible to identify the chemical structure of cannabis components and to obtain its pure constituents. Interest spiked again in the 1990s with the description of cannabinoid receptors and the identification of an Endogenous Cannabinoid System (ECS). The ECS is a "widespread neuromodulatory system that plays important roles in central nervous system development, synaptic plasticity, and the response to endogenous and environmental insults." Since then, treatment safety and effectiveness have been scientifically proven, and a new and more consistent cycle of medicinal cannabis usage has occurred.

Educational Objectives

During this course the participant will:

1. Define THC and CBD;
2. Cite five common medical conditions that cannabis is prescribed to treat;
3. Describe the difference between indica and sativa;
4. Explain the entourage effect;
5. Understand potential oral health implications of cannabis use.

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Sandra Sacks Berger graduated from The Ohio State University with an RDH and BS in Education. She is president of Superior Seminar Solutions (SSS) which manages all areas of CE, Study Clubs and Dental Event Planning. Sandra is very active in NJDHA; serving in many component and state positions and received the Sunstar RDH Award of Distinction in 2007.

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Author Disclosure

Sandra S. Berger, RDH, BS and Bridget Conway, RDH, BA have no commercial ties with the sponsors or the providers of the unrestricted educational grant for this course.

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Educational Objectives:

Upon completion of this course, the clinician will be able to do the following:

1. Define THC and CBD;
2. Cite five common medical conditions that cannabis is prescribed to treat;
3. Describe the difference between indica and sativa;
4. Explain the entourage effect;
5. Understand potential oral health implications of cannabis use.

Abstract:

Cannabis has been used for therapeutic purposes in Western medicine since the mid-19th century, but it was used as a medicine in Asia, mainly in India, since before the Christian era. In the first decades of the 20th century, cannabis use for medicinal purposes decreased significantly in Western medicine due to the difficulty in obtaining consistent potency results from different batches of plant material. Interest in the medicinal benefits of cannabis was renewed when, in 1965, it became possible to identify the chemical structure of cannabis components and to obtain its pure constituents. Interest spiked again in the 1990s with the description of cannabinoid receptors and the identification of an Endogenous Cannabinoid System (ECS). The ECS is a "widespread neuromodulatory system that plays important roles in central nervous system development, synaptic plasticity, and the response to endogenous and environmental insults."Since then, treatment safety and effectiveness have been scientifically proven, and a new and more consistent cycle of medicinal cannabis usage has occurred.

Introduction:

The earliest recorded history of cannabis use dates to the Chinese Emperor Shen Nung in 2727 B.C.

The drug was a mainstay of healing in ancient Greece, China, and India. In our modern history, after decades underground, cannabis has reemerged in a variety of products, methods of consumption, and new strains. As of this printing, medical cannabis is legal, in 26 states and the District of Columbia. Recreational cannabis use is legal in eight states. As a direct result of cannabis's legal status as a schedule 1 drug, it was not widely studied although knowledge is increasing daily. Tetrahydrocannabinol (THC) and cannabidiol (CBD), the two most prevalent pharmacological elements, as well as the entourage effect are of the greatest interest. The entourage effect was first described in 1998 by Israeli scientists Shimon Ben-Shabat and Raphael Mechoulam.

The "entourage effect represents a novel endogenous cannabinoid molecular regulation route. The central idea is that cannabinoids within the cannabis plant work together, or possess synergy, and affect the body in a mechanism similar to the body's own endocannabinoid system, essentially whole-plant medicine. This type of synergism may play a role in the widely held (but not experimentally based) view that in some cases plants are better drugs than the natural products isolated from them."

The need for clinical practitioner recognition and understanding of this new and sometimes controversial mode of medical or recreational use has prompted this chairside primer to assist you with the basic knowledge of an emerging medicine/recreational drug.

History of cannabis use as recreational drug

Marijuana, like alcohol, is often referred to as a social lubricant. In 1920, Mexican immigrants introduced recreational marijuana to Americans when large numbers immigrated north to the US following the Mexican Revolution. The prejudice that many Americans had toward the Mexican newcomers also became associated with marijuana. By the middle of the 1930s, all member states had regulations regarding cannabis and use became prohibited under the law. This was organized under The National Conference of Commissioners on Uniform State Laws who developed the Uniform State **Narcotic Drug Act** in 1934 due to the lack of restrictions in the Harrison **Act** of 1914.[6]

Infamous anti-marijuana propaganda film "Reefer Madness" was produced in 1936 by the French director Louis Gasnier. By the 1960s, marijuana use became widespread among upper-middle class youth and part of the hippie, free spirit culture of this era. Attitudes began warming toward marijuana at a policy level as well. As of December 2016, 28 states and the District of Columbia have legalized medical cannabis, and eight states and DC have legalized recreational marijuana for adults. Although marijuana is still illegal at the federal level, many observers think it's only time until the federal government repeals cannabis prohibition.[7]

Figure 1.

This map was reprinted with permission for the website ProCon.org. This website is updated regularly so please go directly to the website for the most current info. http://medicalmarijuana.procon.org/view.resource.php?resourceID=000881

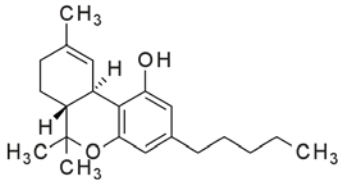
Cannabis plant types

Indica: A strain of marijuana that is smaller and stouter. The psychotropic effect from an indica strain is characterized by lethargy and body sluggishness. Most indica varieties come from central Asia and the Indian subcontinent (Afghanistan, Pakistan, northern India, Tibet, Nepal).

Sativa: A strain of marijuana that typically produces a euphoric, energetic, or cerebral high. Sativas generally originate in the equatorial regions (Thailand, southern India, Jamaica, Mexico).

Hybrid: Most cannabis produced and grown is a combination of both strains.

Figure 2.



THC DEFINITION: Tetrahydrocannabinol: the active ingredient in cannabis, giving it its narcotic and psychoactive effects

Pharmacology of cannabis and pharmacology of the THC molecule

Tetrahydrocannabinol (THC) has been the singular focus of cannabis research since 1964, when Israeli scientist Raphael Mechoulam isolated and synthesized it. Cannabis has been a medicinal plant of unparalleled versatility for millennia,[8] but its mechanisms of action were an unsolved mystery until the discovery of tetrahydrocannabinol.[9]

For thousands of years, cannabis sativa has been used in a therapeutic role. The plant itself contains more than 120 C_{21} terpenophenolic constituents named phytocannabinoids. The Δ^9-tetrahydrocannabinol (Delta-9) type class of phytocannabinoids contains the largest proportion of the phytocannabinoid content. The specific region of the plant, the trichome or gland, is composed of crystal-like tiny hairs, which contain the majority of the cannabinoids, THC, CBD, and CBN.

The Δ^9-tetrahydrocannabinol discovery in 1964 led to the detection of the endocannabinoid system in mammals, including the cannabinoid receptors CB_1 and CB_2. Δ^9-tetrahydrocannabinol exerts its well-known psychotropic effects through the CB_1 receptor, but this effect has limited the use of cannabis medicinally, despite the therapeutic benefits of this phytocannabinoid. Δ^9-tetrahydrocannabinol acts on the brain by binding to specific receptors.

The pharmacological effect of each specific phytocannabinoid is important in the overall therapeutic and recreational effect of cannabis, and slight structural differences can elicit diverse and competing physiological effects. The percentage of each phytocannabinoid can be influenced by various factors such as growing conditions and extraction methods.[10]

The endocannabinoid system

Role of CBD, THC, and the entourage effect

The endocannabinoid system (ECS) refers to a collection of cell receptors and corresponding molecules. The term "steric fit" refers to a lock-and-key mechanism present on the surface of the endocannabinoid cell receptors.

Think of cell receptors as tiny locks on the cells' surfaces. The keys to these locks are chemical molecules called agonists. Each time an agonist binds to a cell, it relays a message, giving the cell specific direction. An agonist is a substance that initiates a physiological response when combined with a receptor. The name, "endocannabinoid" arose from cannabis. Plant cannabinoids were discovered first. *"Endo"* means "within," and *"cannabinoid"* refers to a compound that fits into cannabinoid receptors.

The endocannabinoid system is a series of cell receptors that respond to certain kinds of agonists. Two primary cell receptors make up the ECS, cannabinoid receptor 1 (CB_1) and cannabinoid receptor 2 (CB_2). The keys for these receptors are called endocannabinoids. Endocannabinoids are comparable in effect to the body's natural THC.

Psychoactive THC and the Δ9-tetrahydrocannabinol led to the discovery of the two main endocannabinoid molecules, named anandamide and 2-Ag. Anandamide derived from the Sanskrit word *ananda*, which means bliss. Anandamide literally means "bliss molecule."

Definition of CBD:

Cannabis-derived cannabinoids: Cannabidiol (CBD) is one of at least 113 active cannabinoids identified in cannabis. It is a major phytocannabinoid accounting for up to 40% of the plant's extract. The most studied cannabinoids include tetrahydrocannabinol (THC), cannabidiol (CBD), and cannabinol (CBN). CBD is considered to have a wide scope of potential medical applications due to clinical reports showing the lack of side effects, particularly a lack of psychoactivity (as is typically associated with Delta 9 THC) and noninterference with several psychomotor and psychological functions.

According to a 2013 review published in the *British Journal of Clinical Pharmacology*, studies have found CBD to possess the following medical properties:

Medical Properties of CBD	Effects
Antiemetic	Combats nausea and vomiting
Anticonvulsant	Combats seizure activity
Antipsychotic	Combats psychosis disorders
Anti-inflammatory	Combats inflammatory disorders
Antioxidant	Combats neurodegenerative disorders
Antitumoral/Anticancer	Combats tumor and cancer cells
Anxiolytic/Antidepressant	Combats anxiety and depression disorders

Entourage: chemical teamwork

First described in 1998 by Israeli scientists Shimon Ben-Shabat and Raphael Mechoulam, the central idea of the entourage effect is that cannabinoids within the cannabis plant work together, or possess synergy, and affect the body in a mechanism similar to the body's own endocannabinoid system, essentially whole-plant medicine.

Methods of cannabis consumption

There are four main methods of consuming marijuana: inhalation, oral, sublingual, and topical. Each method has unique characteristics that make it appropriate for some consumers and their reasons for using cannabis.[11,12]

Inhalation

The fastest delivery method of cannabis is inhalation. When a person inhales marijuana, most of the cannabinoids enter the body through the lung and then directly into the blood stream. The effect is almost instantaneous. This allows for a more controlled dose. In a 2007 study in the *Journal of Chemistry and Biodiversity*, subjects who consumed cannabis via inhalation reported feeling the effects of the medication within minutes, with peak effects around the one-hour mark and total duration of effects around two hours.

There are different ways to inhale marijuana. It can be smoked in hand-rolled cigarettes (joints) or in pipes or water pipes (bongs). In these cases, the flowers of the plant are burned and the active components are released into the inhaled smoke. Vaporizing marijuana is becoming much more common. This allows the person to avoid inhaling smoke. The cannabis is heated to a temperature which allows the active ingredients to be released as vapor, which the consumer then inhales. Some vaporizers use a cannabis liquid extract. These extracts or oils may have a very high concentration of THC and may be too strong for some consumers.

Oral

Oral consumption includes edibles, tinctures, capsules, and oils. These are a popular option for those who cannot or do not want to smoke cannabis. Orally consumed cannabis enters the bloodstream after it is digested and absorbed by the intestines. Edibles, such as brownies, cookies, candy, and drinks, can also be a source of nutrients for patients with nausea or eating and digestive disorders. Edibles that need to be digested and absorbed through the gastrointestinal tract take longer to activate within the body—one half hour to an hour—but produce a longer lasting effect. Lipids facilitate assimilation of THC during digestion.

Sublingual

The oral mucosa has a large number of blood vessels which can absorb cannabinoids. Cannabinoids are usually placed under the tongue and held in the mouth. Edibles such as lollipops or lozenges and products that include dissolvable strips, sublingual sprays, or tinctures are considered sublingual. Because it goes through the bloodstream, the onset for this method of consumption is often quicker than oral consumption, which has to go through the digestive system.

Topical

Topical products are lotions, salves, bath salts, and oils that are applied to the skin. These products are often used for arthritis and joint pain. Cannabinoids penetrate the skin and reduce pain and inflammation. These products work well on localized pain and are nonpsychoactive. Onset of action occurs within minutes locally, with duration times lasting one to two hours. Topical application does not allow a significant amount of cannabinoids to reach the brain and thus are unlikely to cause intoxication.

Dosage

When using a cannabis product, it is important to determine its potency. This is especially true for edibles. The exact potency of a product is often difficult to determine because it depends on the potency of the cannabis used to infuse the product. Ten to 15 mg of active cannabinoids (THC, CBS, etc.) is typically a good starting point for medical marijuana patients who are ingesting cannabis for the first time. Thirty to 100 mg of active cannabinoids is considered a daily dose for patients who consume cannabis on a regular basis.[13] THC is processed through the lipid system and 1811-hydroxy Delta 9 THC is produced in the liver during digestion of edibles. The duration of psychotropic effect is longer with consumption of edibles.

Common medical conditions with documented evidence of cannabis therapeutic benefit

Despite its surging popularity, the jury is still out on whether marijuana is truly the panacea its supporters claim it to be. Until recently, the drug's illegal status impeded rigorous study of its effectiveness. Several research groups are now taking advantage of today's lose laws to seek out answers. Listed below are the six most studied conditions demonstrating evidential benefit to date.

Cancer

Numerous trials have indicated that medical marijuana increases appetite and reduces chemotherapy-related nausea in the short term. Yet it may not be as effective as other recently developed drugs, so marijuana is not considered a first-line treatment for these symptoms.

Epilepsy

Multiple animal studies have suggested that THC, one of the main psychoactive chemicals in cannabis, may inhibit the brain processes thought to cause seizures. High-quality human studies are lacking, however, leaving many open questions.[15]

Glaucoma

Several studies have found that smoking marijuana lowers pressure inside the eye, relieving glaucoma-related discomfort for about three to four hours. Yet a number of pharmaceutical drugs have been shown to be more effective and longer lasting than medical marijuana.[16]

HIV/AIDS

In one randomized controlled trial, patients given a cannabis-like compound were twice as likely to gain weight as patients given a placebo—a benefit for people battling the wasting effects of this disease. The treatment's long-term effectiveness remains untested.[17]

Multiple sclerosis (MS)

A large trial published in 2012 found that a cannabis extract significantly decreased muscle stiffness and other MS symptoms.[18] A smaller study found that smoking cannabis worked better than a placebo in reducing both spasticity and pain in treatment-resistant participants.[19] Given the few therapies available for MS, a 2011 review concluded that medical marijuana might be a viable way to manage certain symptoms.

Pain and inflammation

Studies have suggested that marijuana is only slightly better than a placebo in reducing acute inflammation, and it may even increase the perception of pain in some patients. When taken in combination with other medications, however, various cannabis-derived drugs have been shown to be moderately effective for reducing chronic neuropathic pain.[21]

Potential health risks

Breathing problems in patients who smoke marijuana regularly are seen as with patients who use tobacco. Irritation of the lungs and oral mucosa, cough, and more frequent lung infections are also found. Edible marijuana products in and of themselves do not cause potential health risks; however, there are no standards for manufacturing such as in the food industry. Because there is no regulation system in place, patients must be cautious when buying edibles. This is especially true if they have allergies and compromising medical situations.[22]

Overdose

An overdose occurs when the person uses too much of a drug and has a toxic reaction that results in serious, harmful symptoms or death. There are no reports of teens or adults fatally overdosing (dying) on marijuana alone.

However, people can feel some very uncomfortable side effects, especially when using marijuana with high THC levels. There are reports of people seeking treatment in emergency rooms, reporting unease and shaking, and in rare cases, an extreme psychotic reaction (such as anxiety, paranoia, or hallucinations).[23]

General effects of cannabis use

Cannabis use affects multiple systems in the body such as respiratory, cardiovascular, and the central nervous system. The effect varies between users and depends on the mode of consumption and preparation.[24] Cannabinoids interact with a multitude of neurotransmitters and neuromodulators.

Cardiovascular system

THC found in cannabis has shown to consistently increase the heart rate during the initial period of use, through the inhibition of vagal stimulation via interactions with neurotransmitters such as acetylcholine.[25] In contrast, bradycardia may be induced in some regular cannabis users, further emphasizing the complex effect of THC on the body.[21]

Cannabis can elicit variable parasympathetic effects that, in association with a stress response such as a visit to the dentist, may be associated with syncopal episodes. Dental treatment on intoxicated patients can result in the patient experiencing acute anxiety, dysphoria, and psychotic-like paranoiac thoughts. The use of local anesthetic solutions containing epinephrine may seriously prolong tachycardia already induced by an acute dose of cannabis.

Respiratory system

Cannabis use, like tobacco smoking, has a significant impact on the respiratory system. There have been studies that describe the similarities in carcinogenic chemicals between cannabis and tobacco.[22] Cannabis joints are usually smoked to a shorter joint length, which results in a greater number of toxins entering the mouth. Cannabis also has a higher combustion temperature compared to tobacco. Tobacco found in cigarettes is regulated; however, cannabis is a nonregulated substance.[28]

Oral effects

Saliva is commonly known to protect the underlying mucosa from frictional damage. It is also an excellent buffering system involved in protecting the oral cavity, especially the teeth, from dental diseases such as caries.

Caries

A study conducted by Darling et al.,[29] which aimed to determine the oral effects of cannabis, found that dry mouth was experienced by 69.6% of its participants after smoking cannabis, compared to 18.6% of the cigarette smoking control group. Moreover, the effects of dry mouth commenced immediately after the use of cannabis and the duration of the effects were variable between participants.

In contrast, Di Cugno et al.[30] found from their study of 198 young adult participants that cannabis did cause a decrease in parotid saliva flow rate, but this was statistically insignificant as the cannabis-using participants also used amphetamines and none used cannabis alone. However, the results did reveal that the pH of the test group was 6.90, whereas the pH of the control group was 7.51. These findings suggest that a person who uses

cannabis has a reduced saliva buffering capacity compared to someone who does not use cannabis.

Cannabis has an effect on leptin, an important hormone in regulating appetite. Thus, a cannabis user is frequently hungry immediately after cannabis consumption.[31] The combination of reduced saliva production, decrease in saliva pH, and increased appetite can leave teeth vulnerable to attack from potentially cariogenic foods and drinks. A survey by Schultz-Katterbach[32] of participants regarding their diet found that 63% of those who felt hungry post cannabis use had consumed foods and drinks categorized as being sweet.

Soft tissue

Like alcohol and tobacco, cannabis has been found to have a damaging impact on oral soft tissues. Cannabis users have a high incidence of periodontal disease.[33] Xerostomia in these patients and plaque accumulation are closely related to this. Gingival enlargement has also been seen to affect heavy cannabis users. In addition, Darling et al. also found "painful, fiery-red gingivitis" and alveolar bone loss in heavy cannabis users.

A separate study conducted by Darling et al.[34] showed that there was an increased prevalence of candida among cannabis users. The immunosuppressive effect of THC via the CB_2 receptors found on immune cells could potentially allow opportunistic infections, such as candida, to proliferate and become clinically evident.

Cannabis and oral cancer

It is well known that there are many risk factors for oral cancer, some of which include the use of alcohol and tobacco. The combined use of both alcohol and tobacco significantly increases the risk of developing oral cancer. However, the role of cannabis as a risk factor for oral cancer is unclear. There are many conflicting studies. To reach a firm conclusion, rigorous clinical trials with vigorous methods would be required.[35]

A summary of the oral implications of cannabis use

Oral implications of cannabis use	Associated implications
Dry mouth (xerostomia) – short term	Increased risk of caries Increased risk of periodontal disease Increased risk of frictional injuries Halitosis
Thermal injury	Hyperkeratinization due to higher combustion temperature of cannabis
Leukoedema	Normal variation Clinically detectable due to multifactorial reasons: genetics, alcohol, tobacco, and cannabis use
Candidal infection	Increased risk of candida infection (poor oral hygiene/denture hygiene; nutritional deficiency)
Oral cancer	Cannabis contains similar carcinogens to tobacco Possibility of a link with cannabis use; however, more evidence required

Health-care professional protocol

As a health-care professional, it is essential to discuss a patient's medicinal and recreational cannabis use. In states where recreational and/or medical marijuana use is legal, this becomes easier. To encourage disclosure of cannabis use, modification of current medical history forms should include a section with straightforward questions where a patient can simply check a box detailing their use of cannabis (e.g., "Have never used," "Have previously used," or "Currently use"). Hashibe et al.[36] found that participants in their study were more susceptible to underreporting their cannabis use when asked face-to-face than if they were asked through a questionnaire.

Conclusion

As dental professionals, we are likely to encounter cannabis users frequently in our practices. It is important to incorporate questions about patients' patterns of cannabis use as part of the medical history just as enquiries about tobacco smoking are included. Knowledge of cannabis's systemic and oral effects, whether used for recreational or medical purposes, is critical to maintaining an appropriate standard of care.

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Sandra Sacks Berger graduated from The Ohio State University with an RDH and BS in Education. She is president of Superior Seminar Solutions (SSS) which manages all areas of CE, Study Clubs and Dental Event Planning. Sandra is very active in NJDHA; serving in many component and state positions and received the Sunstar RDH Award of Distinction in 2007.

Bridget Conway, RDH, BA

Bridget Conway has authored CE courses & published in several journals. Speaking on a variety of dental subjects, she is well versed in the preventive and restorative facets of dentistry. In addition to an RDH, Bridget has a Business Degree from The Ohio State University. She has been active in MaineDHA & presented at ADHA & other venues.

Author Disclosures

Sandra S. Berger, RDH, BS and Bridget Conway, RDH, BA have no commercial ties with the sponsors or the providers of the unrestricted educational grant for this course.

Online Completion **INSTANT EXAM CODE 15218**

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Questions

1. Cannabis as medicine dates back to the year:
   a. 1920 CE
   b. 1980 CE
   c. 1776 CE
   d. 2700 BC
2. The Discovery of THC that led to further research of therapeutic benefits of phytocannabinoids was in what year?
   a. 1864 CE
   b. 1600 CE
   c. 1964 CE
   d. 1932 CE
3. What Does the acronym THC refer to?
   a. Thermohaline circulation
   b. Tetrahydrocannabinol
   c. Total Health Consensus
   d. Tissue Hematoma Constriction
4. The federal government classifies cannabis as a Schedule I drug and considers it a narcotic. Cannabis advocates believe it should be rescheduled, because it is medicinal and not a narcotic:
   a. 1, narcotic
   b. 3, sedative
   c. 1, sedative
   d. 3, narcotic
5. Which of the following facilitates assimilation of THC during digestion?
   a. Cannabis resin
   b. Water
   c. Lipids
   d. Milk or other dairy product
6. It is crucial to label edible cannabis products with accurate dosage because:
   a. It is possible to 'overdose' on edibles.
   b. It takes longer to feel the effects, and they last over 5 hours.
   c. The medicinal effects last 12 hours or more.
   d. All of the above.

Questions (Continued)

7. Since everyone responds to different dosages of edibles, it is important to:
   a. know the onset time in order not to ingest too much.
   b. drink water
   c. ingest on an empty stomach
   d. all of the above

8. How long before the effects set in when eating cannabis?
   a. One half hour to an hour.
   b. 2 hours.
   c. 10 minutes.
   d. 5 to 6 hours.

9. Cannabis delivery systems include:
   a. Edibles
   b. Oils
   c. Tinctures
   d. All of the above

10. Ways to consume cannabis include:
    a. Injecting
    b. Vaporizing
    c. Eating
    d. Both b and c

11. What is a "trichome"?
    a. A special strain of Cannabis
    b. Plant root
    c. bug infestation
    d. Gland containing THC Cannabinoids

12. Cannabis may be used therapeutically to treat…
    a. Glaucoma
    b. Multiple sclerosis
    c. Complication associated with cancer
    d. All of the above

13. Where is "11 hydroxy delta 9 THC" produced?
    a. In laboratories
    b. In greenhouses
    c. In the liver
    d. In the brain

14. Which are the 3 most commonly known cannabinoids?
    a. THC, LSD, PCP
    b. CEO, CBD, CBN
    c. CBD, LSD, THC
    d. THC, CBD, CBN

15. The active ingredient in cannabis is _____
    a. Nicotine
    b. Cocaine
    c. dopamine
    d. THC or tetrahydrocannabinol

16. Delta-9-tetrahydrocannibinol, the active ingredient in cannabis, acts on the brain by _____
    a. Coating the skull
    b. Binding to specific receptors
    c. Causing brain tissue to grow
    d. Activating fight or flight

17. Indica is a strain of the cannabis plant likely to produce_____
    a. a euphoric feeling
    b. lethargic body sensation
    c. high energy rush
    d. an inability to be still

18. Sativa is a strain of the cannabis plant likely to produce _____
    a. a cerebral high
    b. sluggishness
    c. a euphoric feeling
    d. a and c

19. Cannabis became illegal in the
    a. 1920's
    b. 1930's
    c. 1960's
    d. 1990's

20. The endocannabinoid system uses
    a. uses a lock and key mechanism
    b. is a collection of cell receptors
    c. means "within the cannabis pant"
    d. All of the above

21. The Entourage effect is also called "Partial Plant Medicine"
    a. "Partial Plant Medicine"
    b. "Whole Plant Medicine"
    c. "Synthetic Therapy"
    d. "Wild Botanical Medicine"

22. Cannabis effects chsange in saliva by
    a. Increasing fluoride uptake
    b. Increasing PH
    c. Reducing buffering capacity
    d. Enhancing remineralization

23. CBD _____
    a. is highly psychotropic
    b. has few side effects
    c. interferes with psychomotor functions
    d. is a minor cannabinoid

24. With the increasing use of medical and recreational cannabis the dental professional should identify patients that use it.
    a. To monitor changes in the soft tissue
    b. To reduce the chance of interactions with anesthesia
    c. To educate patients on ramification of cannabis use on the oral cavity.
    d. All of the above

25. The best way to find out if a patient uses cannabis is to _____
    a. confront them as soon as they sit in your chair
    b. Have the receptionist ask them when they make the appointment
    c. includes the information on the medical history form
    d. have a private discussion with them when they are in your chair.

26. The hormone _____ has an effect on appetite. For this reason, a cannabis user is frequently hungry _____ after cannabis consumption
    a. Levaquin, immediately
    b. Leptin, long
    c. Leptin, immediately
    d. Levaquin, long

27. What is a common side effect of cannabis use?
    a. Remineralization of enamel
    b. Xerostomia
    c. Increase in furcations
    d. none of the above

28. What oral implications have been definitively linked to cannabis?
    a. Hyperkeratinization
    b. Oral Cancer
    c. Candida infection
    d. A and C

29. What cardiovascular symptom may accompany initial cannabis use?
    a. Heart rate fluctuations
    b. Decrease in cholesterol
    c. Deep Vein Thrombosis
    d. Increase in triglycerides

30. What is the regulation system in place for medical marijuana assuring quality control for patients?
    a. FDA regulations
    b. USDA regulations
    c. THC regulations
    d. no regulations

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ANSWER SHEET

Cannabis Chairside Primer

Name: Title: Specialty:

Address: E-mail:

City: State: ZIP: Country:

Telephone: Home ( ) Office ( )

Lic. Renewal Date: AGD Member ID:

Requirements for successful completion of the course and to obtain dental continuing education credits: 1) Read the entire course. 2) Complete all information above. 3) Complete answer sheets in either pen or pencil. 4) Mark only one answer for each question. 5) A score of 70% on this test will earn you 3 CE credits. 6) Complete the Course Evaluation below. 7) Make check payable to PennWell Corp. **For Questions Call 800-633-1681**

Educational Objectives

1. Define THC and CBD;
2. Cite five common medical conditions that cannabis is prescribed to treat;
3. Describe the difference between indica and sativa;
4. Explain the entourage effect;
5. Understand potential oral health implications of cannabis use.

Course Evaluation

1. Were the individual course objectives met?

Objective #1: Yes No Objective #2: Yes No Objective #3: Yes No

Objective #4: Yes No Objective #5: Yes No

Please evaluate this course by responding to the following statements, using a scale of Excellent = 5 to Poor = 0.

2. To what extent were the course objectives accomplished overall?	5	4	3	2	1	0
3. Please rate your personal mastery of the course objectives.	5	4	3	2	1	0
4. How would you rate the objectives and educational methods?	5	4	3	2	1	0
5. How do you rate the author's grasp of the topic?	5	4	3	2	1	0
6. Please rate the instructor's effectiveness.	5	4	3	2	1	0
7. Was the overall administration of the course effective?	5	4	3	2	1	0
8. Please rate the usefulness and clinical applicability of this course.	5	4	3	2	1	0
9. Please rate the usefulness of the supplemental webliography.	5	4	3	2	1	0
10. Do you feel that the references were adequate?		Yes		No		
11. Would you participate in a similar program on a different topic?		Yes		No		

12. If any of the continuing education questions were unclear or ambiguous, please list them.

_____

13. Was there any subject matter you found confusing? Please describe.

_____

14. How long did it take you to complete this course?

_____

15. What additional continuing dental education topics would you like to see?

_____

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PennWell Corp.
Attn: Dental Division,
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5.	Ⓐ	Ⓑ	Ⓒ	Ⓓ		20.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
6.	Ⓐ	Ⓑ	Ⓒ	Ⓓ		21.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
7.	Ⓐ	Ⓑ	Ⓒ	Ⓓ		22.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
8.	Ⓐ	Ⓑ	Ⓒ	Ⓓ		23.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
9.	Ⓐ	Ⓑ	Ⓒ	Ⓓ		24.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
10.	Ⓐ	Ⓑ	Ⓒ	Ⓓ		25.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
11.	Ⓐ	Ⓑ	Ⓒ	Ⓓ		26.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
12.	Ⓐ	Ⓑ	Ⓒ	Ⓓ		27.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
13.	Ⓐ	Ⓑ	Ⓒ	Ⓓ		28.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
14.	Ⓐ	Ⓑ	Ⓒ	Ⓓ		29.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
15.	Ⓐ	Ⓑ	Ⓒ	Ⓓ		30.	Ⓐ	Ⓑ	Ⓒ	Ⓓ

AGD Code 016

PLEASE PHOTOCOPY ANSWER SHEET FOR ADDITIONAL PARTICIPANTS.

COURSE EVALUATION and PARTICIPANT FEEDBACK

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INSTRUCTIONS

All questions should have only one answer. Grading of this examination is done manually. Participants will receive confirmation of passing by receipt of a verification form. Verification of Participation forms will be mailed within two weeks after taking an examination.

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PennWell maintains records of your successful completion of any exam for a minimum of six years. Please contact our offices for a copy of your continuing education credits report. This report, which will list all credits earned to date, will be generated and mailed to you within five business days of receipt.

Completing a single continuing education course does not provide enough information to give the participant the feeling that s/he is an expert in the field related to the course topic. It is a combination of many educational courses and clinical experience that allows the participant to develop skills and expertise.

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