Testimony before the NJ Assembly Oversight, Reform and Federal Relations Committee on Marijuana Legalization

David L. Nathan, MD, DFAPA
November 9, 2020

Good morning Chair Danielson and members of the Oversight, Reform and Federal Relations Committee.

My name is Dr. David Nathan. Originally from the Philadelphia area, I attended Princeton University, received my M.D. from the University of Pennsylvania School of Medicine and completed my residency at Harvard Medical School. I am a board-certified psychiatrist, and for the past 19 years I have maintained a private practice in Princeton, New Jersey, where I live with my wife and our two teenage children. I am a Clinical Associate Professor at the Rutgers Robert Wood Johnson Medical School and a Distinguished Fellow of the American Psychiatric Association. For the past 15 years, I have volunteered as the Physician Advisor for the New Jersey State Chapter of the Depression and Bipolar Support Alliance.

I am the founder and board president of Doctors for Cannabis Regulation (or DFCR). With a prestigious roster of physicians, including former Surgeon General Joycelyn Elders and integrative medicine pioneer Andrew Weil, DFCR is the premiere national medical association dedicated to the legalization, taxation, and – above all – the effective regulation of cannabis in the United States. DFCR has members around the world and in nearly every state and US territory, and the organization was conceived through my work with New Jersey United for Marijuana Reform (NJUMR). I am both honored and humbled to count myself among the many New Jerseyans who have devoted countless hours to the fight for cannabis legalization and regulation.

Last Tuesday, the voters of the Garden State delivered a united and unequivocal message to the nation: The era of New Jersey's misguided cannabis prohibition must, and will, end.

Now comes the challenging work of building a legal cannabis industry that serves the interests of public health and social justice. Today I offer my perspective as a physician and father on the essentials of good regulation of cannabis.

I would first like to address those in the medical community who believe that systemic racism is not a public health issue. The fact is that cannabis prohibition has always disproportionately targeted communities of color, and the resulting poverty is an enormous obstacle to health care access. I have debated this point with the leadership of the Medical Society of New Jersey (MSNJ) and the New Jersey Psychiatric Association (NJPA), which – to this day – continue to hold that the harm inflicted upon communities of color by their ongoing support for the drug war is worth the suffering it causes.

I am a proud member of both the MSNJ and NJPA, so I say this not to diminish their past work, but to hold their future advocacy to a higher standard. The medical community – through our medical associations – must live up to its repeated promises to root out systemic racism wherever it is found. This requires acknowledgment of the implicit biases that led to the misguided institutional support for the infliction of punishment upon adults who use drugs, especially upon those that choose to use a non-lethal drug that is less harmful to them than alcohol and tobacco. The MSNJ and NJPA missed the boat on cannabis legalization, but they

still have the opportunity to renounce the ongoing racially-biased war on drugs, and I will continue to push them until they do so. Just as we cannot have peace without justice, we will not have a healthy community without social justice.

DFCR's Platform of Regulations promotes a core set of principles based on public health and social justice that should be included in any regulatory framework in legalized jurisdictions. There are three public health provisions in our Platform of Regulations. First is the need for government oversight of cannabis production, testing, distribution, and sales. For this, we should look to the best features of other states' actions on this front.

Our second key priority is the prevention of non-medical underage cannabis use through evidence-based education about the risks of cannabis use, child-resistant packaging, a ban on packaging, marketing, and advertising that attracts underage users, and penalties for adults who enable diversion of cannabis to minors.

The third priority is the labeling of cannabis products. With the limited time available to me, I would like to focus on one regulatory issue that touches upon several others. Proper labeling is the linchpin for successful evidence-based cannabis regulation, as it represents the final endpoint of numerous regulatory processes. I have closely studied the labeling standards of other states and nations. Some are good, some need improvement, but none have adequately addressed the needs of consumers and the public. For this reason, and given our limited time, I would like to focus the remainder of my remarks on a new labeling paradigm developed by DFCR physicians for use in legalized states and (eventually) at the federal level. Attached to my written testimony is an article published this past summer in *Cannabis Science and Technology*. It outlines the essential parts of the Universal Cannabis Information Label (UCIL) and the Universal Cannabis Product Symbol (UCPS).

Today I would like to offer the State of New Jersey permission to adapt and adopt these standards. I also offer my time to help regulators customize the UCIL and UCPS to fit New Jersey's specific needs. DFCR would be honored for New Jersey to become the first state in the nation to follow these evidence-based standards.

The new label was designed to serve the needs of medical cannabis patients, adult consumers, and non-consumers alike. It includes all product information one would expect, including product form, weight, ingredients, and cannabinoid and terpene profiles. It also introduces critical facts on serving size, including for product forms for which consumers have not previously received any guidance in any jurisdiction. The label includes a QR code that can validate the authenticity of a regulated product and link to more detailed information about cannabis use, misuse, safety testing, and other facts beyond what can fit on a product package.

Finally, the new package label provides a standardized, concise, and consistent set of warnings that touch upon essential areas of concern based on demographics of users and health issues with particular product forms. It has some of the same labeling requirements specified by S21/A21, but my medical colleagues and I believe that the Universal Cannabis Information Label is a superior standard that New Jersey would be wise to follow.

After reviewing the symbols currently used by states and foreign nations to identify cannabis products, all either manifest design problems or signal unintended messages about cannabis use. That is why I further propose that New Jersey adopt the Universal Cannabis Product Symbol (UCPS), a novel design that visually represents "caution before cannabis". It features a

bold exclamation point centered upon a realistically rendered silhouette of a cannabis leaf, with the two graphics framed within the familiar rounded triangular caution sign.

These labeling standards are designed to meet the needs of regulators, cannabis businesses, medical professionals, and consumers. Stakeholders in all four groups have described them as simultaneously compact, comprehensive, and clear.

I am excited by the opportunity before us to design public-health-minded, evidence-based cannabis regulations from basic principles. If the Legislature adopts these standards for cannabis products, New Jersey cannabis products will immediately become the gold standard for labeling – not just in the United States, but also in the world.

Ladies and gentlemen, I thank you for your time and attention. I would be happy to answer your questions.

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Setting the Standard for Cannabis Labeling:

Introducing the Universal Cannabis Product Symbol and the Universal Cannabis Information Label

By DAVID L. NATHAN

As the US Federal government and individual states move toward legalization of cannabis for medical and adult use, universal labeling standards are essential. Legalized states have adopted a patchwork of labeling schemes that often fail to serve the needs of public health, public safety, patients, or consumers. This article proposes cannabis labeling standards to serve as a foundation for the regulation of cannabis product packaging for both medical and adult-use products. The two key elements presented include a Universal Cannabis Product Symbol (UCPS) and a Universal Cannabis Information Label (UCIL) that can be applied to the full range of product types. The UCIL provides standardized product information; information about cannabinoids, terpenes, and flavonoids; product warnings; the product's lot number and expiration date; and a QR code that can link to further information. When applicable, the UCIL will also include product ingredients and quantification of a serving or dose. State and federal regulators—as well as other stakeholders—are encouraged to contact the author for permission to adopt or adapt these designs.

AS THE US Federal government and individual states move toward full legalization of cannabis for adults, the regulation of cannabis product labeling is essential to ensure the protection of public health and safety.

Currently, each state that legalized cannabis for medical or adult use has adopted a different set of requirements for cannabis labeling. These standards vary widely in content and quality. Many cannabis product symbols are poorly designed. In the worst cases, labels are printed in small typeface, provide ambiguous and confusing information, and fail to serve the interests of cannabis patients and consumers.

Cannabis regulations generally, and labeling regulations specifically, must strike a reasonable balance. If too lax, then the regulations will fail to protect public health and safety. If too strict and overly encumbering, then the nascent legal market will have difficulty competing with unregulated supply chains, and the untaxed, illegal trade will continue to thrive. Also, over-regulation in labeling can have the effect of obscuring critical information that could be buried in a well-intentioned but unnecessarily detailed or alarmist set of data, warnings, and other text.

As a beginning of what will surely be an iterative process, the author proposes two key elements of a single cannabis labeling standard for both medical and adult-use cannabis products:

- *A Universal Cannabis Product Symbol (UCPS)* on the exterior of packages, so adults and children can immediately identify cannabis products and differentiate them from other types of products
- *A Universal Cannabis Information Label (UCIL)* with critical and actionable information about the product, presented in a format that literate lay people can easily understand

Universal Cannabis Product Symbol: *"Caution Before Cannabis"*

Excluding products that meet the federal definition of hemp, all cannabis products, defined as any product containing plant material, extracts, or synthetically produced phytocannabinoids of *Cannabis sativa* L., should utilize a single set of standards. The author encourages state regulators to adopt or adapt these standards, as a first step toward a national standard in the United States.

Figure 1 introduces a novel design for a universal symbol to appear on all cannabis product packages. Only legal, properly tested, and regulated cannabis products should be licensed to bear this symbol.

FIGURE 1 *UCPS: "Caution Before Cannabis."*

The symbol, which represents "Caution Before Cannabis," features a bold exclamation point centered in front of a cannabis leaf, with the two graphics framed with a rounded triangular caution sign in a contrasting color.

This symbol should be prominently displayed against a plain background on the main facing side of the product package. The height of the symbol should be no less than 10% of the smallest dimension of the package face, with a minimum size of 3/4 in. (1.9 cm).

Several color combinations are possible, but only one will be chosen for the UCPS to promote ease of identification (see **Figure 2**). The decision about which color scheme to use remains open for discussion. In general, the most recognizable caution sign uses black on a yellow background. Red is frequently used to call attention to warnings, so versions with red are shown here. Cannabis is associated with the color green, and that could aid with ease of recognition, but colors other than red, yellow, and black are seldom used on caution signs. Finally, a black and white version may be needed when printing is only possible in black and white.

FIGURE 2 *UCPS in different color combinations.*

The word "CANNABIS" should be printed in capital letters below the symbol if not prominently and clearly displayed elsewhere on the front of the package. Text should be in Helvetica or Arial (black or bold) typeface, using a location and size proportional to lettering and symbol as shown in **Figure 3**, with a minimum 12-point font size. The text color should be black or white, whichever is most prominent against the background.

This symbol was designed in Adobe Illustrator and will be freely available for download and use by package designers in multiple formats (PDF, PNG, JPEG, and so on). The version with text will also be provided for download.

This design has several advantages compared to current cannabis product symbols (see **Figure 4**). The exclamation point centered in a yellow triangle is the most familiar visual device that communicates caution or warning without implying prohibition of use or exaggerated dangers (such as a stop sign). While "THC" is a device that has been used to represent cannabis, many people do not know the significance of THC and its connection to cannabis.

The symbol includes an outline of the most recognizable device specific to cannabis—a mature cannabis leaf—that does not promote its use or represent a means of consumption. The silhouette of the leaf is realistically rendered, improving ease of recognition and educating the public on the identification of cannabis plants. Because the exclamation point is superimposed on the leaf, they are both large, improving ease of recognition. The placement of the exclamation point over the leaf conveys an important message, making the symbol emblematic of an important public health principle: "Caution Before Cannabis."

FIGURE 3 *UCPS with text.*

Universal Cannabis Information Label

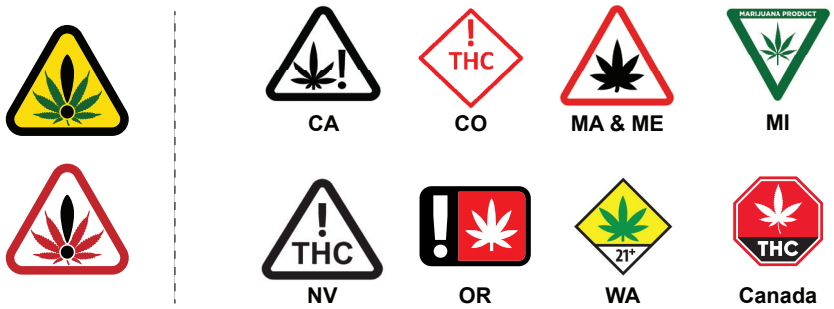
The Universal Cannabis Information Label (UCIL) includes all information that is particular to the product and necessary for informed, safe consumption.

This label is printed on or affixed to cannabis product packages. Only legal, properly tested, and regulated products should be permitted to bear this label. The label is divided into five sections that are color coded and contained within boxes, as shown in **Figure 5**.

Several categories of information are intentionally excluded from the UCIL:

1. Information that isn't directly related to the objective attributes of the product or would appear elsewhere on the package
2. Commercial information about the manufacturer; sativa, indica, or hybrid info; strain name; and other product branding
3. Food allergy information
4. Information that should be the same in all legal, regulated products (for example, pesticide-free)

FIGURE 4 *The proposed "Caution Before Cannabis" symbol, shown with various North American cannabis product symbols currently in use.*

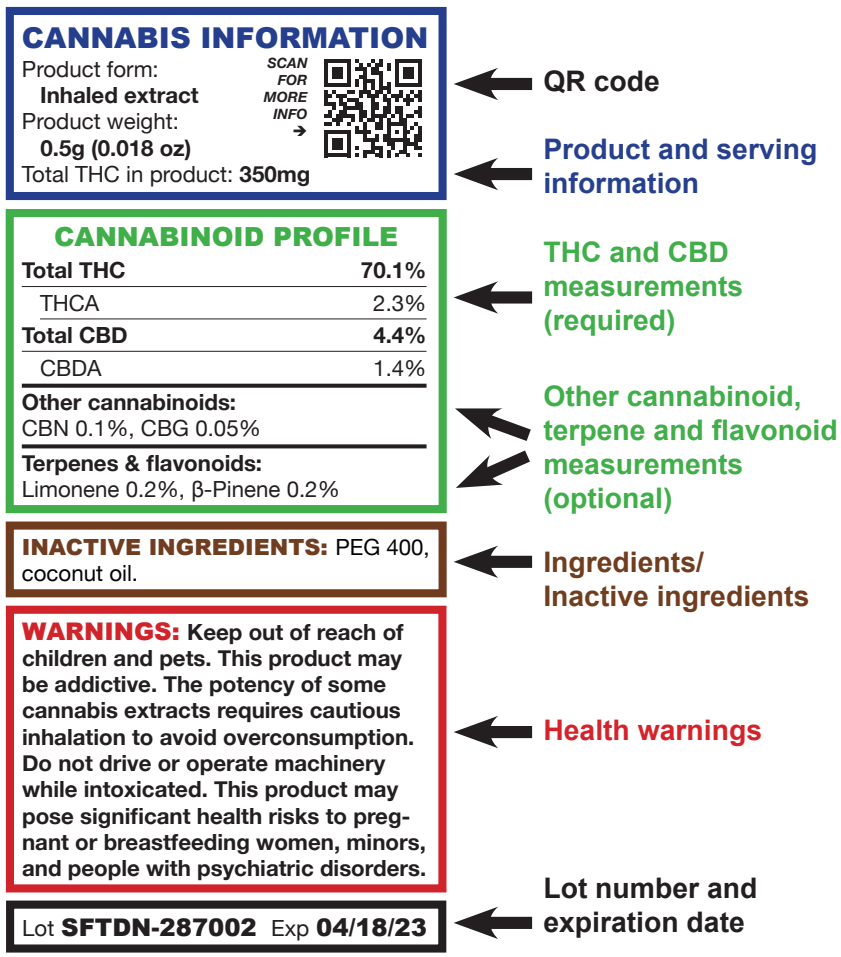


Adapting the UCIL for Medical Cannabis and Adult-Use Cannabis

To ensure that patients and consumers only need to comprehend one "universal" cannabis information label scheme, the UCIL is designed for nearly identical labeling for both medical cannabis and adult-use (that is, "recreational") cannabis. While there are numerous legal distinctions between medical and adult-use cannabis, the products themselves are interchangeable. All adult-use cannabis products may be used by patients for medical purposes, while some product forms—such as suppositories—are almost exclusively formulated for medical use. Thus, the terms "serving," "serving size," and "consumer," which are appropriate for the adult use of cannabis, can be substituted with terms like "dose" and "patient" when the product is grown and sold for medical use (see **Figure 6**).

To clearly distinguish between medical and adult-use cannabis products, medical cannabis products should display the statement: "FOR MEDICAL USE ONLY" prominently on the package, using Helvetica or Arial Black typeface at a 12 point font size in a color contrasting the background.

FIGURE 5 *Sections of a sample UCIL.*



Individually Boxed Sections of the UCIL

Cannabis Information: Product and Serving Information

This section provides the most basic and

critical information about the product. It is displayed at the top of the UCIL, and therefore carries the header "CANNABIS INFORMATION." The blue cannabis information box includes information about the product form (flower, inhaled extract, oral extract, edible, and so forth), product weight (in grams and ounces, or milliliters and fluid ounces), serving size (when applicable to the product form), total servings per package, and a QR code.

The number of approved product forms should be large enough to include all regulated products, but small enough to minimize confusion by patients and consumers. The units used for product weight are determined by the product form: grams and ounces for most products, and milliliters and fluid ounces for some liquid products.

While the number of product forms is flexible if new means of consumption are developed, for now there are seven product forms:

1. Flower
2. Inhaled extract
3. Oral extract
4. Edible or drinkable
5. Topical
6. Suppository
7. Transdermal patch

A serving size or dose is based on a standard amount of tetrahydrocannabinol (THC). While experts disagree on the optimal serving size for consumers and a dose for patients, with a usual range of 5–15 mg, for this prototype label the author has chosen the commonly used serving size or dose of 10 mg of THC. At the bottom of the cannabis information box is a definition linked to serving size or dose by an asterisk (*). Total servings is simply a calculation of the total weight of the packaged product divided by the weight of a single serving or dose containing 10 mg of THC.

A QR code provides patients and consumers additional information about the product or offers information about safe use and the health effects of cannabis, either in encoded text or a link to a webpage.

FIGURE 6 *Sample UCILs for identical medical versus adult-use cannabis flower.*

UCIL for **medical** cannabis product

CANNABIS INFORMATION

Product form: **Flower**
Weight: **3.5g (1/8 oz)**
Dose: **166mg***
Total doses: **21**

SCAN FOR MORE INFO →

*Dose based on estimated inhalation and absorption of 10mg of heated Total THC. Dose for flower consumed orally is 40% of the number shown. Actual ingestion may vary significantly.

CANNABINOIDS IN ONE DOSE

Total THC	**15.1%**	**10.0mg**
THCA	2.3%	1.5mg
Total CBD	**13.4%**	**8.9mg**
CBDA	1.4%	0.9mg

Other cannabinoids (mg/dose): CBN 0.63, CBG 0.30

Terpenes & flavonoids (mg/dose): β-Caryophyllene 3.4, Myrcene 2.5, Linalool 0.2, Limonene 7.7, α-Humulene 2.3, α-Pinene 1.9, β-Pinene 1.0

WARNINGS: Keep out of reach of children and pets. This product may be addictive. Do not drive or operate machinery while intoxicated. This product may pose significant health risks to pregnant or breastfeeding women, minors, and people with psychiatric disorders.

Lot **SFTDN-287002** Exp **04/18/23**

UCIL for **adult-use** cannabis product

CANNABIS INFORMATION

Product form: **Flower**
Weight: **3.5g (1/8 oz)**
Serving size: **166mg***
Total servings: **21**

SCAN FOR MORE INFO →

*Serving size based on estimated inhalation and absorption of 10mg of heated Total THC. Serving size for flower consumed orally is 40% of the number shown. Actual ingestion may vary significantly.

CANNABINOIDS IN ONE SERVING

Total THC	**15.1%**	**10.0mg**
THCA	2.3%	1.5mg
Total CBD	**13.4%**	**8.9mg**
CBDA	1.4%	0.9mg

Other cannabinoids (mg/serving): CBN 0.63, CBG 0.30

Terpenes & flavonoids (mg/serving): β-Caryophyllene 3.4, Myrcene 2.5, Linalool 0.2, Limonene 7.7, α-Humulene 2.3, α-Pinene 1.9, β-Pinene 1.0

WARNINGS: Keep out of reach of children and pets. This product may be addictive. Do not drive or operate machinery while intoxicated. This product may pose significant health risks to pregnant or breastfeeding women, minors, and people with psychiatric disorders.

Lot **SFTDN-287002** Exp **04/18/23**

Cannabinoid Profile, Cannabinoids in One Serving, or Cannabinoids in One Dose

This section, framed in a green box, provides patients and consumers with product data about cannabinoids, terpenes, and flavonoids.

Several guidelines are followed in this section:

1. Measurements of THC and cannabidiol (CBD) are required
2. Tetrahydrocannabinolic acid (THCA) and cannabidiolic acid (CBDA) are required when relevant to the product form and means of consumption
3. The most important compounds are shown in boldface
4. This section includes relevant but optional measurements of other cannabinoids, terpenes, and flavonoids
5. For edibles, this section also includes essential nutritional information in a subsection entitled "Nutrients in One Serving"
6. THCA and CBDA are listed separately given their distinct properties when consumed in unheated products
7. THCA and CBDA are not listed separately in edibles, when the product is heated at some point before use, as heat converts those compounds into Δ^9-THC and Δ^9-CBD

8. Flower and inhaled extracts may be consumed unheated if prepared and consumed at low temperature rather than smoked or vaporized
9. The active form of THC (Δ^9-THC) should also be listed separately for oral extracts, as the THCA is generally not heated after laboratory testing of this product form
10. All measurements of THC and other product components should be derived from testing at approved and licensed laboratory facilities

For the purposes of the UCIL, the calculation of total THC from THCA and Δ^9-THC must account for the lower molecular weight of Δ^9-THC, which is 87.7% of THCA's molecular weight. Thus, total THC = (% or mg of THCA * 0.877) + (% or mg of THC). Likewise, the calculation of total CBD from CBDA and Δ^9-CBD must account for the lower molecular weight of Δ^9-CBD, which is 87.7% of CBDA's molecular weight. Thus, total CBD = (% or mg of CBDA * 0.877) + (% or mg of CBD).

Ingredients or Inactive Ingredients

Framed in a brown box, this section only appears in the UCIL for relevant product forms. Ingredients are listed for edibles and contains all ingredients, including cannabis and its derivatives. Inactive ingredients are listed for inhaled extracts, oral extracts, topicals, and suppositories; and when used it excludes cannabis and its derivatives.

Warnings

The warnings section, framed in red, is designed to be comprehensive enough to cover key at-risk groups, but the text is concisely worded to maximize the likelihood that patients and consumers will read and remember the contents of the label.

There are standard warnings for all cannabis products, targeting groups at risk from cannabis consumption:

1. All users (at risk for cannabis use disorder)
2. Small children (at risk for accidental consumption)
3. Minors (at risk for intentional, nonmedical consumption)
4. Adults with psychiatric disorders (including psychosis and substance use disorders)
5. Pregnant and breastfeeding women
6. Patients and consumers driving or operating machinery

All UCILs include these standard warnings: *"Keep out of reach of children and pets. This product may be addictive. Do not drive or operate machinery while intoxicated. This product may pose significant health risks to pregnant or breastfeeding women, minors, and people with psychiatric disorders."*

There are additional specific warnings for particular product forms:

1. Overconsumption of inhaled extracts: "The potency of some cannabis extracts requires cautious inhalation to avoid overconsumption."
2. Overconsumption of edibles: "Do not exceed serving size."
3. Oral consumption of topicals: "For external use only."
4. Delayed effects of oral extracts and edibles: "Intoxicating effects may be delayed by more than 2 hours and can last up to 8 hours."

Lot Number ("Lot") and Expiration Date ("Exp")

If other sections of the UCIL are unique and customized to each lot (as is the case for flower, which is always unique in its cannabinoid profile), then the lot number and expiration date are included on the custom printed UCIL. If homogenization of the product allows for identical labels across many lots (as for some edibles or topicals), then the lot number and expiration date may be included on the label or legibly printed or embossed elsewhere on the package.

Style Guide

This template was created using Adobe InDesign and is designed for ease of use. The template will be available for download by regulators, manufacturers, and package designers.

The selection of typeface and weight are intended to make information organized, clear, and easily understood by lay people. "Cannabis Information," "CANNABINOIDS IN ONE SERVING," "CANNABINOID PROFILE," "NUTRIENTS IN ONE SERVING," and "WARNINGS" appear in Helvetica or Arial Black typeface, while all other text is in Helvetica or Arial Regular typeface. The lot number and expiration date appear in Arial Black typeface, but "Lot" and "Exp" appear in Helvetica or Arial Regular. The information about product information should be in Helvetica or Arial Bold typeface. All "WARNINGS" text should be in Helvetica or Arial Bold. "Total THC," "Total CBD," "THC," "CBD," and associated numerical values should be in Helvetica or Arial Bold. All other text should be in Helvetica or Arial Regular.

Text should be clearly printed in a font size no smaller than 8 point, and headings should be proportionately larger as indicated in the UCIL samples provided here.

For ease of comprehension, and given margins of error in measurements, all numbers may be rounded to the fewest number of digits needed for 95% correlation between actual and estimated numbers. Thus, 26.6 can be rounded to 27 (>95% accuracy), but 4.6 should not be rounded to 5 (<95% accuracy). Actual numbers should be used in all calculations.

Layout Options

The individual sections can be rearranged for different sizes and shapes of packages, as shown in **Figure 7**, with the exception that the brown

"Ingredients" box may not be placed at the top of stacked UCIL sections. If the UCIL is unique to each lot (as is always the case for flower), then the label may be printed onto a sticker that is securely affixed to the package. However, if homogenization of the product allows for identical labels across many lots (as for some edibles or topicals), then the label may be included in the package design. If the package is too small to include the label, then a printed copy may be placed inside the package, as long as a copy is clearly displayed with the product at the point of sale.

UCIL Samples for Different Product Forms

While the UCIL is designed for simplicity and uniformity, minor variations are necessary for different product forms. Thus, labels for flower do not require a section on ingredients, while edibles are the only category that includes nutrition information. What follows are sample UCILs and specific notes for each of the seven defined product forms.

I. UCIL for flower (Figure 8)

A. Examples: Flower, shake

B. Cannabis Information (blue box)

1. Factors determining cannabis flower serving size (or dose in the case of medical cannabis):

(a) 60% loss through the process of inhalation by vaporization or smoking, which means that 40% of the product is actually consumed

(b) Full activation of THCA to THC by heating through vaporization or smoking

(c) X% = (weight of THC / weight of flower) * 100

2. Serving size is based on estimated inhalation and absorption of 10 mg of heated total THC. In other words, the serving size is the weight of flower (in mg) needed for absorption of 10 mg of X% total THC through vaporization or smoking

(a) The UCIL should note that the loss through inhalation does not apply to the preparation of homemade edibles from flower, so the serving size of orally consumed flower is 40% of the stated serving size

3. Formula: Serving size in mg = 10 mg / (X% of total THC * 40% yield during inhalation)

(a) Example: For 15.1% THC flower, the calculation is 10 / (0.151 * 0.4) = 165.5 mg, rounded to 166 mg

(b) Example: For 15.1% THC flower, the calculation is 10 / (0.151 * 0.4) = 165.5 mg, rounded to 166 mg

4. Servings per container is the number of servings of 10 mg of absorbed total THC in the container

(a) Servings in 1/8 oz (that is, 3540 mg) container of flower = 3540 mg/serving size

(b) Example: For 15.1% THC flower, the calculation is 3540/165.5 = 21.3, rounded to 21

5. Printed message about the basis for serving size: "Serving size is based on estimated inhalation and absorption of 10 mg of heated total THC. Serving size for flower consumed orally is 40% of the number shown. Actual ingestion may vary significantly."

C. Lot number and expiration date (black box)

1. Because multiple sections of the UCIL are unique to each batch of flower, the lot number and expiration date should be included on the custom printed UCIL

FIGURE 7 *Alternate layout of sample UCIL sections.*

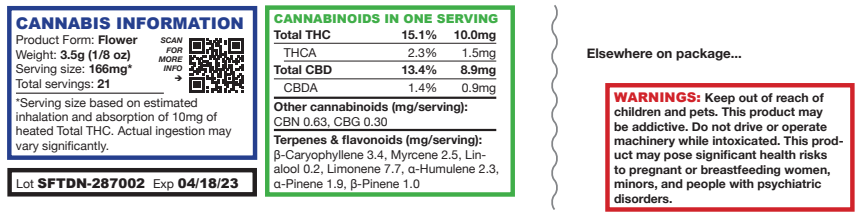


FIGURE 8 *Sample UCIL for flower.*

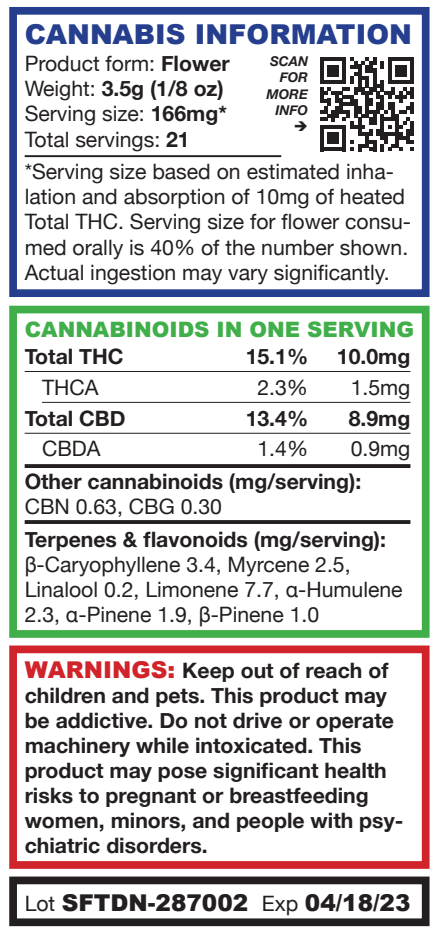
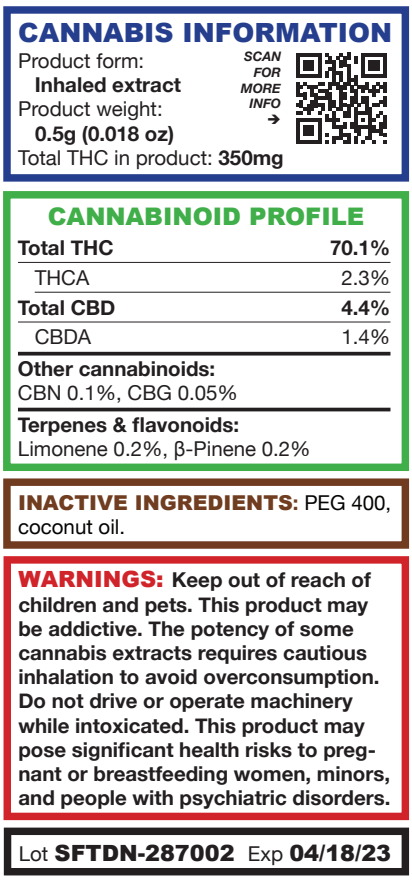


FIGURE 9 *Sample UCIL for inhaled extracts.*



II. UCIL for Inhaled Extracts (Figure 9)

A. Examples: Hashish, oil concentrates, vape pens, dabs, shatter, wax

B. Notes

1. Serving size cannot currently be quantified because of variability in inhalation and the difficulty of accurately dividing small amounts of a concentrated product

2. Inactive Ingredients are listed, given the need for transparency about excipients, especially since the emergence of e-cigarette or vaping use-associated lung illness (EVALI)

III. UCIL for Oral Extracts (Figure 10)

A. Examples: Tinctures, tablets

B. Notes

1. Oral extracts are defined as products that are retained in the mouth for mucosal absorption rather than swallowed for gastrointestinal absorption

(a) A hard candy or lozenge is considered an edible for adult-use cannabis products and an oral extract for medical cannabis products

2. Dose (or serving size) units depend upon the type of extract, for example, units of tablets or lozenges, volume of tinctures

3. Because the product is generally not heated between testing and consumption, 10 mg of the active form of THC is the basis for one dose.

4. Printed message about the basis for serving size: "Dose is based on oral ingestion of 10 mg of the active form of THC."

IV. UCIL for Edible or Drinkable Products (Figure 11)

A. Examples: Brownies, gummies, cannabutter, cannabis-infused drinks

B. Notes

1. Edibles are differentiated from oral extracts if the product is swallowed rather than retained in the mouth for mucosal absorption

(a) A hard candy or lozenge is considered an edible for adult-use cannabis products and an oral extract for medical cannabis products

2. For cannabis-infused drinks, the term "Drinkable" is substituted for the word "Edible" on the UCIL

3. Serving size (or dose) should be based upon the weight or volume of the product containing 10mg of THC

(a) The product itself should be scored or molded so that it can be easily divided into equal, individual servings

(b) The serving size in this sample assumes full activation of THCA to THC through heating at some stage in the preparation of the edible product, so total THC and THCA are not differentiated on the label

4. Printed message about the basis for serving size: "Serving size is based on 10 mg of the active form of THC. New users should start with one-half of a serving (5 mg of THC)."

5. Essential nutrition information should be listed, including ingredients, calories, total fat, total carbohydrate, protein, and sodium

6. Ingredients include any cannabis derivative contained in the product

V. UCIL for Topical Products (Figure 12)

A. Examples: Creams, lotions, ointments

B. Notes

1. Serving size cannot be easily quantified because it depends upon the area of application

2. This product label should only be used for cannabis products that are specifically formulated for external use, and if the product is flavored for oral consumption, it should be labeled as an edible or drinkable product form

3. Although topically applied cannabis extracts are unlikely to lead to the absorption of THC or intoxication, warnings should include all standard warnings and a warning about the delayed and prolonged effects of oral consumption

VI. UCIL for Suppositories (Figure 13)

A. Examples: Vaginal suppositories, rectal suppositories

FIGURE 10 *Sample UCIL for oral extracts.*

CANNABIS INFORMATION
Product form: **Oral extract**
Product weight: **40g**
Dose:
One lozenge (2g)*
Total doses: **20**
SCAN FOR MORE INFO →
*Dose based on oral ingestion of 10mg of the active form of THC.

CANNABINOIDS IN ONE DOSE

Total THC	12.3mg
THC (active form)	**10.0mg**
THCA	1.7mg
Total CBD	**0.65mg**
CBDA	0.21mg

Other cannabinoids: CBN 0.4mg
Terpenes & flavonoids: Limonene 0.2mg

INACTIVE INGREDIENTS: Isomalt, citric acid, natural lemon flavor.

WARNINGS: Keep out of reach of children and pets. This product may be addictive. Intoxicating effects may be delayed by more than 2 hours and can last up to 8 hours. Do not drive or operate machinery while intoxicated. This product may pose significant health risks to pregnant or breastfeeding women, minors, and people with psychiatric disorders.

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B. Notes

1. Dose (or serving size) should be one or more whole suppositories
2. Printed message about the basis for one dose: "Dose is based on 10 mg of the active form of THC."
3. This product label should only be used for cannabis products that are specifically formulated for use as suppositories

VII. UCIL for Transdermal Patches (Figure 14)

A. Examples: THC patch

B. Notes

1. Dose (that is, serving size) should always be one patch
2. Printed message about the basis for one dose: "Dose is based on 10 mg of THC."

FIGURE 11 *Sample UCIL for edibles.*

CANNABIS INFORMATION
Product Form: **Edible**
Total weight:
160g (5.6 oz)
Serving size: **16g***
(one cookie)
Servings per container: **10**
SCAN FOR MORE INFO →
*Serving size based on 10mg of THC. New users should start with one-half of a serving (5mg of THC).

CANNABINOIDS IN ONE SERVING

THC	**10.0mg**
CBD	**8.9mg**

Other cannabinoids: CBN 0.02mg
Terpenes & flavonoids: Limonene 2.1mg

NUTRIENTS IN ONE SERVING

Calories	80
Total Fat	3g
Total Carbohydrate	18g
Protein	1g
Sodium	60mg

INGREDIENTS: Enriched wheat flower, chocolate chips (sugar, chocolate, milkfat, cocoa butter, soy lecithin), sugar, eggs, butter, brown sugar, vanilla extract, baking soda, salt, cannabis extract.

WARNINGS: Keep out of reach of children and pets. This product may be addictive. Do not exceed serving size. Intoxicating effects may be delayed by more than 2 hours and can last up to 8 hours. Do not drive or operate machinery while intoxicated. This product may pose significant health risks to pregnant or breastfeeding women, minors, and people with psychiatric disorders.

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3. This product label should only be used for cannabis products that are specifically formulated for external use
4. Although topically applied cannabis extracts are unlikely to lead to the absorption of THC or intoxication, warnings should include all standard warnings and a warning about the delayed and prolonged effects of oral consumption

FIGURE 12 *Sample UCIL for topicals.*

CANNABIS INFORMATION
Product form: **Topical**
Product weight:
60ml (2 oz)
Total THC in product:
250mg
SCAN FOR MORE INFO →

CANNABINOID PROFILE

Total THC	**0.41%**
THCA	0.17%
Total CBD	**0.41%**
CBDA	0.09%

Other cannabinoids: CBN 0.003%, CBG 0.004%
Terpenes & flavonoids: Linalool 0.002%, Limonene 0.027%, α-Humulene 0.002%, α-Pinene 0.0019%, β-Pinene 0.010%

INACTIVE INGREDIENTS: Coconut oil, orange blossom extract.

WARNINGS: Keep out of reach of children and pets. This product may be addictive. For external use only. Intoxicating effects may be delayed by more than 2 hours and can last up to 8 hours. Do not drive or operate machinery while intoxicated. This product may pose significant health risks to pregnant or breastfeeding women, minors, and people with psychiatric disorders.

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Conclusion

The UCPS and UCIL set a high standard for labeling in the nascent regulated cannabis industry. The different labeling elements are designed to serve the interests of patients, consumers, public health, and public safety.

When interstate cannabis commerce is permitted under Federal law, a unique and universally adopted cannabis product symbol like the UCPS will be critical to facilitate ease of identification of cannabis products regardless of the state in which they are manufactured. Likewise, the UCIL will standardize the presentation of cannabis product information

for the benefit of patients and consumers.

Along with the UCPS and UCIL, there are two other key aspects of cannabis packaging that we will simply mention here, as they are beyond the scope of this article:

- Other product information printed legibly in a manner chosen by the manufacturer
  - Name of product
  - Manufacturer's name
  - Attestations of purity (for example, "pesticide-free")
  - Other information relevant to the product (for example, name of strain, extraction method, and so forth)
- Package design conducive to the safe adult or medical use of cannabis
  - A ban on cartoon characters or other visual devices that appeal to minors or are similar to those used in products intended for purchase by minors
  - A ban on unsubstantiated claims about the product
  - Child-resistant containers, which are key to prevent accidental ingestion

A number of important questions merit further research and discussion:

- What is the optimal color scheme for the UCPS?
- Is the estimation of 60% loss of product during cannabis inhalation accurate and supported by the best available evidence?
- Is it technologically possible to quantify a serving size for inhaled extracts?
- While the number of product forms will likely increase in the future as the industry evolves, are there other product forms that should be included now?
- Are there other warnings or categories of information that should be included in the UCIL?

Cannabis stakeholders are encouraged to contact the author for permission to use the UCPS and UCIL. The author looks forward to working with state regulators, trade organizations, cannabis companies, and researchers who wish to adopt or adapt these proposed standards for their particular needs.

FIGURE 13 *Sample UCIL for suppositories.*

CANNABIS INFORMATION
Product form: **Suppository**
Product weight: **40g**
Dose: **One suppository (2g)***
Total doses: **20**
SCAN FOR MORE INFO →
*Dose based on 10mg of the active form of THC.

CANNABINOIDS IN ONE DOSE

Total THC	12.3mg
THC (active form)	**10.0mg**
THCA	1.7mg
Total CBD	**0.65mg**
CBDA	0.21mg

Other cannabinoids: CBN 0.4mg
Terpenes & flavonoids: Limonene 0.2mg

INACTIVE INGREDIENTS: Cocoa butter, polyethylene glycol.

WARNINGS: Keep out of reach of children and pets. This product may be addictive. Intoxicating effects may be delayed by more than 2 hours and can last up to 8 hours. Do not drive or operate machinery while intoxicated. This product may pose significant health risks to pregnant or breastfeeding women, minors, and people with psychiatric disorders.

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FIGURE 14 *Sample UCIL for transdermal patches.*

CANNABIS INFORMATION
Product form: **Transdermal patch**
Dose: **One patch***
Doses per container: **10**
SCAN FOR MORE INFO →
*Dose based on 10mg of THC.

CANNABINOIDS IN ONE DOSE

THC	**10.0mg**
CBD	**8.9mg**

Other cannabinoids: CBN 0.02mg
Terpenes & flavonoids: Limonene 0.21mg

WARNINGS: Keep out of reach of children and pets. This product may be addictive. For external use only. Intoxicating effects may be delayed by more than 2 hours and can last up to 8 hours. Do not drive or operate machinery while intoxicated. This product may pose significant health risks to pregnant or breastfeeding women, minors, and people with psychiatric disorders.

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