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The Many Ways to Consume: Formats + Tools



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The Upside of Smoking

- Fast-acting – peak plasma levels 1-3 minute
- Activates plant cannabinoids via decarboxylation
- Minimal duration – 1-3 hours
- Difficult to overconsume





The Downside of Smoking

- Tar + carbon monoxide in the lungs
- 25% loss due to exhalation
- Difficult to record dosage
- Limited cannabinoid bioavailability – 10-25%





ABCs of Smoking

- Joints made of buds or shake (leaves covered with dry trimmed crumbs from plant)
- Water pipes cool the smoke entering lungs
 - No data to support water trapping toxins
- Inhalation depth, breath hold + cannabis grind affect user response
- Best analgesic response with 9% THC or higher





Vaporizing Basics

- Smokeless, low temperature inhalation method
- Less toxic byproducts, more efficient THC extraction
- Pen (atomizers) + tabletop models heat via electric coil
- Heat to decarboxylate + turn plant oils into vapor
- 60-90% cannabinoid retention with vaporizing
- THC + CBD activate at lower temp, CBG + CBD require higher temp





What About Dabs

- Single hit of inhaled vaporized concentrates (ear wax, shatter, butter) containing 60-90% THC
- High potency + bioavailability = large THC bolus at once
- Potential 40-60 mg THC in one hit
- Cautioned use for inexperienced patients





Inhalation Uptake

- THC absorbed by fatty tissue (lungs, liver, heart brain)
- Blood-brain barrier can account for delay between peak plasma levels + psychoactive effect
- 90/90 rule – 90% THC is diffused from plasma into organs within 90 minutes
- Estimating dosage with inhaled products is difficult but can be done with patient records





THC Content

- Total THC Content = THCA + delta-9 THC
 - Low potency – below 6% THC
 - Normal potency – 6-14% THC
 - High potency – 14-30% THC





Estimating Inhaled THC Content

- Product weight x THC% = maximum THC availability + loss for flame + exhalation
- 25-50% THC is lost with flame + 25% exhalation loss
- Vaporized cannabis – higher bioavailability, 60-90%
- Recording individual patient use + outcomes is key to personalized dosing





Cannabinoids Stored in the Body

- THC plasma levels drop quickly, but metabolites measurable
 - In blood for 1 month
 - In urine up to 3 months
- Extended cannabinoid half-life due to slow release from fatty tissue
- Fatty lining of lung tissue can be irritated by long-term use





Dabbing Risks

- Solvent residue (hexane, butane, propane) from extraction poses a risk
- Long-term exposure can lead to encephalopathy
- Carefully assess patient's dab use





Oral Absorption Methods

- Fast absorption, measured dosing, discrete use, no residual smell
- Tinctures – hold in mouth to maximize sublingual + buccal membrane absorption
 - Alcohol-based dissolves cannabinoids (bright green)
 - Glycerin-based typically infuse cannabinoids into hash oil
- Homemade alcohol tinctures are optional, but estimating potency is challenging





Oral Onset Data

- Sativex (10 mg – 20 mg CBD + 10 mg THC) data for MS, spasms, pain relief
- Longer onset time + longer lasting versus smoking (plasma levels fell to lower than 50% in 3 hours)
- Lozenges, hard candies – 15-30 minute onset
- Honey, oils on gums increase buccal absorption





Tincture Protocol

- 1st CBD only
- 2nd add indica
- 3rd add sativa
 - At least 6 hours or alternate days between cultivars
- Patients with high anxiety
 - 1st CBD only
 - 2nd add THCA





The Upside of Edibles

- No fear of smoking
- Duration of 4-12 hours
- Can be used as a prophylactic for inflammation reduction
- After baseline, microdosing reduces frequency + intensity of chronic pain





The Downside of Edibles

- Unpredictable + sometimes adverse reaction
- Up to 90% delta-9 THC can be metabolized in liver to 11-hydroxy THC
- Response is highly variable among individuals
- Poor quality + inconsistent cannabis sometimes used in products





GI Absorption with Edibles

- Edibles are absorbed into bloodstream through small intestine
- Transit time + fat content of food in stomach influence onset
- Genetic variation in CYP450 system enables patients to do well with cannabis for pain control
- 11-hydroxy THC levels higher with ingested cannabis
- Typical duration of 6-12 hours + varies based on body fat composition





Ectomorph versus Endomorph

- Ectomorphs clear cannabis quickly, quicker onset, shorter duration
- Endomorphs + high triglyceride patients need higher dosages





Non + Hyper Responders

- Ingested non-responders do better with inhalation
- Hyper responders need less than 10 mg to trigger paranoia
- Extensive OTCs, many prescriptions, or alcohol users tend to hyper respond





Raw Cannabis

- Hemp
 - Seeds
 - Meal
 - Oil – gamma-linoleic + stearidonic acids (3:1 ratio)
- Raw juice offers support for autoimmune disorders (chlorophyll is antioxidant)
- Raw cannabis acids (THCA, CBDA) stimulate CB2 receptors in gut, organs, immune system





Skin Absorption

- Topicals – penetrate into epidermis only, non-psychoactive, localized anti-inflammatory, muscle relaxers
 - Creams, salves, balms, bath salts, personal arousal products
- Transdermals – THC or non-psychoactive forms, absorbed into bloodstream, used over venous areas (ankles or wrists) not pain area, duration of 8-12 hours
 - Gels, lotions, patches





Other Absorption Methods

- Rectal suppositories create less 11-hydroxyTHC, so lower psychoactivity, promising results for colorectal cancer patients
 - Colon mucous membrane lining dictates efficacy
 - Onset 15-20 minute, duration of 4-6 hours
- Intravenous – very little use due to administration, needed in medical setting, insurance + licensing issues





Delivery Method Recap

- Inhalation – onset in 1-3 minutes, duration of 1-3 hours
- Sublingual – onset in 15-30 minutes, duration of 2-4 hours
- Ingestion – onset in 30-90 minutes, duration of 6-12 hours
- Topicals – onset in 30-60 minutes, duration of 2-4 hours
- Transdermal – onset in 15-30 minutes, duration of 6-12 hours
- Rectal – onset in 15-30 minutes, duration of 6-8 hours
- Raw – cumulative effect over time





Dosing + Titrating

- Self-titration, trial + error
 - Keep treatment journal for 2-4 weeks
- Wide variance in patient response
- Chronic pain + seizures respond well to low dose prophylactic use
- Microdose used to achieve baseline
- Sprays, tinctures, or inhalation for quick pain relief





A Diverse Cannabis Consumption Plan

- Different format + different cultivars for different issues
- Raw juice to reduce inflammation + CBD tincture as prophylactic
- Inhalation for acute pain + low dose edible for sleep
- Migraine + fibromyalgia respond well to 1:1 (CBD to THC)
- Seizures respond well to 12:1
- Nausea or cachexia respond well to higher THC, lower CBD





Dosage Guidelines

- Adults under 150 lbs start at 2.5-5 mg THC
- Adults 150-200 lbs start 5-10 mg THC
- Adults over 200 lbs start 10-15 mg THC
- Children under 90 lbs start 1-2.5 mg CBD
- Edible tolerance takes about 2 weeks

