

Answers to all our FAQs in one compact volume

Marijuana Medical Handbook by Dale Gieringer PhD, Ed Rosenthal, and Gregory T. Carter MD; Quick American, Oakland, 2008; 257 pages (paperback); \$19.95.

Reviewed by Frank Lucido, MD

This well-organized, well-documented book presents a wide range of material concisely and clearly. Patients and caregivers should find it readable and understandable. At the same time, practicing physicians should find it credible and useful.

I had two copies of the original 1998 edition, one at my medical office and one at home, as ready references. It is with sadness I note that my friend and colleague, the late Tod Mikuriya, MD, co-authored that edition. His place has been taken by very capably by Gregory T. Carter, MD, an associate clinical professor of rehabilitation medicine at the University of Washington.

Let us now leaf through the 10 chapters...

Safety

The authors open with a chapter on safety. They simply let the facts about cannabis as medicine speak for themselves: “unlike... alcohol, aspirin, opiates, nicotine, and caffeine, cannabis is not known to cause fatal overdoses.”

They explain why in a discussion on the body’s own endocannabinoid system: “receptor cells for this system are concentrated in many parts of the brain and body, but are relatively lacking in the brainstem, which controls vital functions such as breathing and heartbeat. Therefore, even strong doses do not endanger life.”

Cannabis is not for everybody, they note, truthfully. After 38 years in medicine, I haven’t found any pharmaceuticals that are, either. And I have seen many highly-touted, FDA-approved medicines taken off the market within a year for unacceptable mortality and morbidity.

What Marijuana Does

“Researchers are only beginning to understand the function of the endocannabinoid system. Animal studies indicate that it plays a role in regulating immunity, inflammation, neurotoxicity and trauma, blood pressure, body temperature, appetite, gastrointestinal function, analgesia, glaucoma, epilepsy, depression and stress, and even bone formation.

“Endocannabinoids tend to fine-tune biological responses upwards or downwards as needed within the range necessary to maintain healthy function.”

Mikuriya was the first clinician to document the amazingly wide range of conditions for which cannabis provides relief. Former Drug Czar Barry McCaffrey held a press conference in December, 1996 to make fun of Mikuriya’s finding, as if it was absurd that one drug could be so versatile. Now that physicians have confirmed that cannabis has numerous applications, it is the federal government’s insistence that it has none that seems absurd.

Medicinal Uses of Marijuana

The Handbook lists the following major categories:

- Anti-emetic and appetite stimulant in the treatment of AIDS and HIV; Hepatitis C; Morning Sickness and other conditions involving nausea.

- Anti-convulsant and anti-spasmodic in the treatment of Spinal Cord Injuries, Paraplegia, and Quadriplegia; Epilepsy; Gastrointestinal Disorders; Menstrual disorder and labor pain; Tourette’s Syndrome; Dystonia; Cerebral Palsy;

Chorea; Tardive Dyskinesia; Parkinson’s Disease; Black Widow Poisoning.

- Analgesic in the treatment of Chronic Pain and Migraine.

- Anti-inflammatory, immunomodulator and neuroprotectant in the treatment of Rheumatism and Arthritis; Multiple Sclerosis; Amyotrophic Lateral Sclerosis; Alzheimer’s Disease; Pruritus and Skin Diseases; Sickle Cell Anemia.

- Mood elevator in treating Clinical Depression; Anxiety; Post-Traumatic Stress Disorder (PTSD); Attention Deficit Hyperactivity Disorder (ADHD); Chronic Fatigue Syndrome; Insomnia.

- Harm-reduction substitute for alcohol and other hard drugs.

They also note that cannabis has proved effective in treating Glaucoma; Asthma; Brain damage due to stroke or alcohol; and that it has “possible antitumoral effects.”

Adverse Effects

Providing the pros and cons, as any good clinician should, the authors devote a chapter to “real and imaginary” side effects. Allergic reactions, though rare, are real and can manifest as rapid heartbeat, faintness/fainting, twitches, numbness, headaches and rashes. “If you regularly experience discomforting reactions from marijuana, the best treatment is to avoid it,” the authors wisely advise.

Growing Medicinal Marijuana

Ed Rosenthal became known as “the guru of ganja” by giving cultivation advice in his “Ask Ed” column. I suspect it was Ed who contributed the following line in the Handbook: “It is not uncommon for gardeners to become obsessed with growing this plant. From my observations of marijuana growers, I have come to the conclusion that using marijuana is not addictive, but growing it is.”

Everything the prospective grower needs to know is right here, from acquiring seeds and clones to manicuring and drying. Rosenthal is also famous for his close-up photographs of cannabis buds, and perhaps the only shortcoming of the Handbook is that they are presented here in black-and-white rather than color.

Preparation and Dosage Methods

Delivery systems available to medicinal marijuana users include smoking, vaporization, tinctures, edibles, and topicals. Edibles typically take 45-60 minutes to come on, but their effects can last six to eight hours.

One question frequently asked by patients who are new to using marijuana as medicine concerns the difference between smoking and ingesting via edibles. The handbook explains: “Anything absorbed through the stomach is processed by the liver before it reaches the brain. In the liver, THC is converted to 11-hydroxy-THC, a metabolite that is if anything more psychoactive than ordinary THC. Because 11-hydroxy-THC is not produced when marijuana is smoked, eating and smoking produce different pharmacological effects.

“Some people regulate their conditions by eating small amounts of marijuana on a regular basis, sometimes just once or twice a day. They barely feel any effect from the drug except for the relief of their symptoms.

“The major drawback of ingesting marijuana is that the effective dose can be difficult to predict.”

Terpenes: More Than Just A Pretty Smell

For years researchers thought that different ratios of cannabinoids created marijuana’s varying effects. However, studies of modern marijuana varieties show that most varieties contain large amounts of THC but hardly any of the other cannabinoids. This led researchers to take a second look at terpenes, the odor molecules found in plant essential oils.

Almost all plant odors, from perfumy flowers to herbs and spices, are composed of plant terpenes. Plants produce terpenes for several reasons: to attract pollinators, to attract predators of herbivores, and to repel or kill predators. Spices and herbs derive their characteristic odors from the essential oils they produce. Each plant’s oil is a combination of different terpenes. Many terpenes are found in oils of different plants. For instance, limonene, which lends citrus its characteristic odor, is also found in spices such as rosemary, juniper, peppermint and marijuana.

Plant essential oils, each of which contains its own combination of terpenes, are used in aromatherapy because the terpenes affect our mood and brain function.

Scientists now think that different combinations of terpenes can account for the various medical benefits and mood alterations in different varieties of marijuana.

Just as rose varieties have different odors, marijuana varieties have unique odors ranging from sweet to skunky, from floral to acrid. Each of these odors indicates combinations of terpenes. Some of them, such as the various analogs of limonene, are familiar. The limonenes carry citrus odors such as orange, tangerine, lemon and grapefruit. Limonene is thought to enhance alertness and focused attention, and also has fungicidal properties.

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Since the terpenes affect the marijuana experience, by learning to recognize some of the odors you can anticipate how a particular marijuana will affect you. Odor is your clue about the type of medicinal qualities. Marijuana varieties with similar odors will usually provide the same kind of relief.

Here are some of the other terpenes that are found in cannabis:

Myrcene

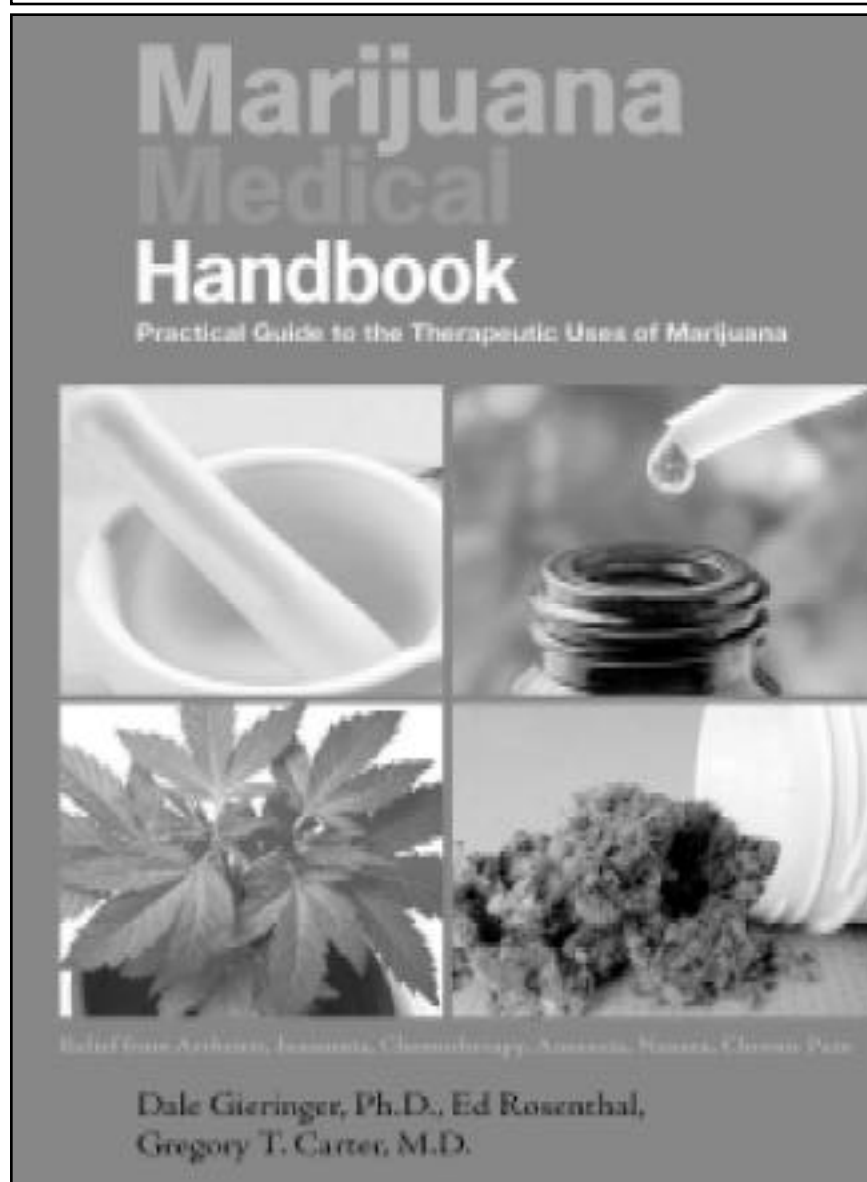
Myrcene is the most prevalent terpene found in marijuana. Its odor is described as citrus, clove-like, earthy, fruity, green-vegetative and mango. The differences in odor are the result of slight differences in the makeup of the molecule. Notice that all of these odors are used to describe marijuana. Myrcene is a potent analgesic, anti-inflammatory and antibiotic. It blocks the effects of the pro-mutagens implicated as carcinogens such as aflatoxin B. It is found in small amounts in many essential oils associated with anti-depressive and uplifting behavior.

Myrcene is probably a synergist of THC: a combination of the two molecules creates a stronger experience than THC alone. Myrcene probably affects the permeability of the cell membrane, allowing more THC to reach the brain.

Beta-caryophyllene

Beta-caryophyllene smells and tastes peppery, with hints of clove and camphor. It is a major component of oils of clove and black pepper. It has

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Dear Michele Obama,

I'm writing to you today as a mother, a fellow professional, and a Christian. My name is Dr. Marion Fry and I practiced medicine in California. My husband is an attorney who is currently disabled.

In the year 1997 I was diagnosed with metastatic breast cancer. This was my worst fear because when I was 10 years old my mother died of the same disease. At that time my youngest child was five years old and my oldest was 10.

Over the next three years I struggled to regain my health and care for my children. The conflict became apparent to me when all my physicians recommended that I use medical cannabis as an herbal alternative to the drugs that were not working. Even in California where marijuana is legal with a medical recommendation it was difficult to obtain, but critical for my survival. It was the only drug that could stop my vomiting, increase my appetite and elevate my spirit for the battle that I was engaging in, the fight of my life.

During my struggle, I became aware that I was in the right position, as a physician, to help sick, dying and disabled Americans with this non-toxic drug. Recognizing the lack of law and guidance I sought legal advice into the possibility of enacting the California statute.

As my health improved I opened a highly professional practice in which the patients had a consultation with both my husband as a lawyer and myself as a physician in order to ascertain the appropriateness of this non-toxic herb in their medical regime. I required all

my patients to prove through medical records from independent doctors the validity of their illness. As a medical/legal team, our goals were to follow the California law and assist sick Californians with the legal protection afforded them under the California law.

Under the previous administration, my entire family has suffered severe persecution in the name of the Federal laws. I know that it is not Pres. Obama's intent to unfairly persecute those individuals who are willing to stand up for those who are too weak and ill. My intent was administration of the law in California I did not, despite legal counsel; understand I was committing a crime. I am asking for mercy because my heart and motives were always pure.

With legal advice my husband and I established the California Medical Research Center for the evaluation and recommendation of medical cannabis. However as a California physician I did not understand I was in violation of Federal law.

Three weeks after 9/11 2001, the Federal government raided my house at gunpoint. My son and I were held in handcuffs for four hours and terrorized while the government searched for evidence of wrongdoing. Our activities may have been technically wrong but our intent was supported by local law enforcement. We were told that since we lived on 27 acres in an isolated area, if my husband could grow excess medicine for sick and dying people there was no problem. We never charged money for this service; we were only trying to help. This Federal assault has resulted in extreme damage to my family and

my career.

June 21 of 2005 the Federal government arrested both my husband and me. This was a complete miscarriage of justice. At the trial the Federal government had the power to control all the information available to the jury. The jury was not permitted to know anything about the medicinal benefits of marijuana or the legal use of it in California. The case is currently on appeal and I am out on bond. However I am unable to practice medicine because of the Federal conviction. I am no longer able to support my family. I had a productive small business providing jobs and contributing to our small community.

During this time my husband's back failed. He suffers from a rare disease, hemophilia A, and chronic severe pain. Because of his conviction he is forced to use dangerous narcotic drugs that are destroying his ability to think, his liver and ultimately, his life. Considering our motives were compassionate treatment of the sick, I believe he should not be required to pay with his life. When his doctor was recommending medical marijuana for his pain control it was almost exclusively through eating a purified form of this medicine. He would take one to two minor painkillers to supplement. Now he is on the five different medicines including methadone, dilaudid, Oxycontin, Flexeril, Compazine and the medicines required for his hemophilia. He is not allowed to use medical marijuana even though his doctor highly recommends this non-toxic plant as an excellent alternative to these dangerous narcotic drugs.

Because of the government's trickery, the deputy sheriffs who had openly approved of my husband's garden and encouraged him to grow more plants testified against us in court. The government wanted to prove that we had grown over 100 plants requiring a minimum mandatory sentence in Federal prison of five years. To do this they used the sheriff's testimony of the plants he saw growing at our house over three years and then added them together to reach a number around 105 plants.

Because of the legal advice we had obtained, we were well aware that we should never have over 100 plants at one time. We were not aware that they could use the plants grown, and then add the amount over years nor had any of our attorneys warned us of this possibility.

I come from a long line of innovative forward thinking physicians. I want to work, I need to work but I am unable. This complete political misunderstanding has resulted in 8 years of persecution and our conviction. The appeal process is lengthy and uncertain. In the meantime my entire family is struggling and my education and desire to help people is being wasted. I am 52 years old, a cancer survivor, and a talented physician with no recourse.

If there is anything that you or your husband can do to pardon us for the sake of justice and truth, I could resume working and helping the people in California I took an oath to care for. Thank you for considering my plea,

With highest regards to both you and your husband,

**Marian Fry, MD
Cool, California**

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Cooking with Marijuana

The authors are economy-minded. They advise that cooking with trim or leaf can yield the most bang for your buck. Here's their practical advice on reducing the "weedy" taste:

"The strong flavor of marijuana comes from its water-soluble compounds. However, these can be extracted, leaving the leaf with a much less intense flavor.

"Use the whole leaf. Place the marijuana in a bowl, being sure not to pack it too tightly. Add tepid water and let the marijuana soak for about half an hour. The water changes color as much of the chlorophyll and other pigments are dissolved. Pour off the water. The marijuana is now ready to be used as is, or it can be dried and powdered.

"After pouring off the water and removing the marijuana, you'll probably see a tan-colored residue at the bottom of the bowl. This substance consists of glands that have fallen off the leaf. It can be dried and is very potent."

Waste not, want not!

Dealing With Drug Testing

One of the saddest effects of the War on Drugs is that the American people have been forced to accept the indignity of peeing in a cup as a condition of employment—or playing sports in high school. Tests for marijuana do not reveal whether people are impaired—which would be useful and might prevent accidents—but only whether their urine contains illegal metabolites.

The authors advise getting a prescription for Marinol (synthetic THC, a Schedule III drug) before getting tested. Marinol has been approved for combating nausea and stimulating appetite. A prudent physician cannot prescribe it to

a patient whose goal is to obscure a test, as this would be colluding to violate federal or state drug laws.

However, a physician might prescribe Marinol to provide the medical benefits of THC to a patient traveling out of state, or anytime that use of cannabis is not possible, or not appropriate.

Choosing a Variety

Most cannabis users have heard that the two main types are "sativa" and "indica." Few are aware how imprecise the classifications are. "Originally," the authors explain, "the names sativa and indica designated two different naturalized species, or landraces from different parts of the world. These landraces have now been so interbred that the basis for the original distinction has become highly dubious... There remains no scientifically agreed upon definition for sativa or indica, nor any definitive analysis of their respective biochemical, pharmaceutical and genetic properties."

According to popular lore, "Sativas have fruity, floral and sweet aromas. They are said to be focusing, energizing and inspirational... Indicas have a dry, acrid, even skunk-like odor. They are said to be relaxing, sleep-inducing, anti-nauseant, and relieving of stress and pain."

The Handbook provides interesting information about the role terpenes might play in cannabinoid therapeutics. See box on previous

Obtaining Medical Marijuana

The famous *Conant* ruling that guarantees the right of physicians to discuss cannabis as a treatment option (on First Amendment grounds) does not allow us to tell patients where to obtain it. "Most cannabis dispensaries are now listed on the Internet at such websites as

www.canorml.org," the Handbook states.

The body of literature devoted to medical marijuana is growing rapidly, and patients who want to learn more about how it works, etc., now have a

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analgesic qualities, but doesn't have a mental effect. A recent study by Swiss researchers found that beta-caryophyllene binds to the CB-2 receptor and has anti-inflammatory effects in mice [Gertsch et al.1]. Beta-caryophyllene is therefore a kind of non-psychoactive cannabinoid analog.

Pinene

Pinene has a piney odor and is a major component of turpentine. It is found in pine trees as well as rosemary, sage and eucalyptus. It is thought to help memory by crossing the blood-brain barrier and inhibiting the activity of the chemical that destroys an information transfer molecule. As a result this molecule has a longer time to work before it is inactivated, resulting in better memory. It also increases focus, self-satisfaction and memory. The skunky odors of some marijuana varieties are created in large part by analogs of this terpene, which are indications of its presence.

Terpenol

Terpenol smells floral, with hints of lilac and orange blossom. Terpenol causes drowsiness, and a desire to rest. It is often found in cannabis in conjunction with pinene, which masks its odor. This is what causes some Afghan varieties to have such a sedative affect. It is useful for sleep problems, as well as being a general sedative.

Borneol

Borneol smells like menthol or cam-

phor. It is considered calming in Chinese medicine and helps people relax.

Linalool

Linalool has a floral scent reminiscent of spring flowers such as lily of the valley, but with spicy overtones. It is a component of lavender oil. It is being tested for use on some cancers [Ravizza et al. 2][Cherng et al.3][Russin et al.4]. It causes severe sedation when inhaled.

Patients looking for help sleeping should seek a floral-sweet variety. For patients seeking a separation from body discomforts, some sativa varieties transport you to a different mental state that can range from focused to distracted, ultimately helping you to become less aware of the pain and discomfort. They often have a citrus or fruity odor. If you wish to remain conscious, beware of linalool's floral sweet undertones subtly hidden under the limonene-citrus odors. The linalool component overtakes the conscious space and puts you to sleep.

Pulgone

Pulgone has a minty-camphor odor and flavor used by candy makers. It is thought to slow the destruction of memory transfer proteins so memory is improved. It also helps keep you alert and may counteract the terpenol and linalool to some extent.