MMP-037

New Jersey Department of Health
Medicinal Marijuana Program
PO 360
Trenton, NJ 08625-0360

MEDICINAL MARIJUANA PETITION
(N.J.A.C. 8:64-5.1 et seq.)

INSTRUCTIONS

This petition form is to be used only for requesting approval of an additional medical condition or treatment thereof as a "debilitating medical condition" pursuant to the New Jersey Compassionate Use Medical Marijuana Act, N.J.S.A. 24:6I-3. Only one condition or treatment may be identified per petition form. For additional conditions or treatments, a separate petition form must be submitted.

NOTE: This Petition form tracks the requirements of N.J.A.C. 8:64-5.3. Note that if a petition does not contain all information required by N.J.A.C. 8:64-5.3, the Department will deny the petition and return it to petitioner without further review. For that reason the Department strongly encourages use of the Petition form.

*This completed petition **must** be postmarked **August 1 through August 31, 2016** and sent by **certified mail** to:*

New Jersey Department of Health
Office of Commissioner - Medicinal Marijuana Program
Attention: Michele Stark
369 South Warren Street
Trenton, NJ 08608

Please complete each section of this petition. If there are any supportive documents attached to this petition, you should reference those documents in the text of the petition. If you need additional space for any item, please use a separate piece of paper, number the item accordingly, and attach it to the petition.

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1. **Petitioner Information**

Name: [redacted]

Street Address: [redacted]

City, State, Zip Code: [redacted]

Telephone Number: [redacted]

Email Address: [redacted]

2. **Identify the medical condition or treatment thereof proposed. Please be specific. Do not submit broad categories (such as "mental illness").**

SPINAL STENOSIS, 4 HERNIATED DISCS SCIATICA ARTHRITIS DIABETES BROKEN SHOULDER, PERIPHERAL VASCULAR DISEASE CAD CHRONIC PAIN

3. **Do you wish to address the Medical Marijuana Review Panel regarding your petition?**

- ☐ Yes, in Person
- ☑ Yes, by Telephone
- ☐ No

4. **Do you request that your personally identifiable information or health information remain confidential?**

- ☐ Yes
- ☑ No

If you answer "Yes" to Question 4, your name, address, phone number, and email, as well as any medical or health information specific to you, will be redacted from the petition before forwarding to the panel for review.

5. ***Describe the extent to which the condition is generally accepted by the medical community and other experts as a valid, existing medical condition.***

Please see attached letters from my physicians.

I suffer from chronic pain as a result of several conditions, the most severe being Spinal Stenosis and 4 badly herniated lower discs. Besides the constant pain in my lover back I have severe sciatic pain down my entire right leg. I have great difficulty bending over or lifting.

I have great difficulty sitting, standing or lying in bed for any length of time. I spend most of my time in a recliner with my legs raised on pillows. I also suffer from very bad circulation in my arms and legs, which causes pain, fatigue and swelling in my left leg. I use a cane to get about, but I am leaving the apartment less and less.

I also have a shoulder that is broken as a result of a fall. It is broken in two places. Specialist advised that they would need to do a graft from a cadaver bone to attempt to fix the top break. The second break is further down my arm. There is a two-inch space between the two bones, so grafting back together cannot occur. I am advised that the surgery could take 13 hours, and taking into consideration all the meds I take, and my other severe conditions, in particular Peripheral Vascular Disease, (which causes me significant pain in my lower legs and makes walking very difficult) my Doctor will not clear me for surgery.

Rehab will take 4 to 6 weeks. I live alone and have no one to assist me.

6. ***If one or more treatments of the condition, rather than***

the condition itself. are alleged to be the cause of the patient's suffering, describe the extent to which the treatments causing suffering are generally accepted by the medical community and other experts as valid treatments for the condition.

I don't believe treatments are causing the condition, but the many Epidurals I have had over the years, no longer give me any relief. Epidurals have been the standard procedure, but now my pain and discomfort has increased so much that I no longer benefit from them. The sciatica feels like constant fire.

Several rounds of physical therapy have had no effect, and cause my pain to increase exponentially.

I told the doctor that the pain meds no longer seem to be effective. He tells me that this is not unusual for this kind of injury. That after taking meds for a long time, they stop working. I am afraid to increase my meds, as that can be dangerous.

I go to Pain Management Therapy, which teaches "Mindful Meditation," which is designed to take your mind off your pain, but as the pain increases, it has become harder and harder to concentrate. It has been little or no use to me lately.

7. Describe the extent to which the condition itself and/or the treatments thereof cause severe suffering, such as severe/or chronic pain. severe nausea and/or vomiting or otherwise severely impair the patient's ability to carry on activities of daily living.

When pain meds could no longer control my pain, the Doctor (Rathi) prescribed Fentanyl Transdermal Pain Patches. In every dosage, even at 12 mcg/h I became violently nauseated, and had horrible diarrhea after 3 cycle of the patches. I tried several rounds and dosages, trying new things like taking pills to help with

the nausea. or eating only certain foods when using the patches, but nothing helped, and so we stopped the patches.

The chronic pain from these injuries, and others has severely compromised my quality of life. The inability to walk more than a few hundred yards without crippling pain, has prevented me from leaving my apartment. I have to have my groceries delivered as well as my medication. Doctor visits will cause me to be in bed afterwards.

I no longer see my friends unless they come to visit me. I can no longer sit through church services due to hard wooden pews. I am only 68 years old, and I often feel that life as I knew it is over. This causes serious depression, and I cry often out of pain and frustration.

8. Describe the availability of conventional medical therapies other than those that cause suffering to alleviate suffering caused by the condition and the treatment thereof.

I have previously described some of the treatments used to try to lessen my pain. I take 2 Oxycodone APAP TAB 5-325MG daily. Any more and these too cause nausea, and I am afraid to increase the dosage. They do not seem to be helping, but I continue to take them, fearing how much worse my pain would be without them.

Because I suffer from a number of serious conditions, I am not a good candidate for further treatments such as surgeries. My Primary Physician and Heart Specialist feel that I might suffer from prolonged anesthetic. My GP does not feel he can authorize me for surgery. I use medication, heat and cold to try to lessen the pain, with little or no effect. I live alone and have difficulty recuperating from surgery.

I suffer from the following:

- Shoulder (left) severely broken due to a fall, in 2 places. It was determined that I would have difficulty withstanding a 13-hour operation and a long recuperation period. I live alone and have no close relatives. There are many days when this causes me much pain, I have to sleep sitting up. I only have 45% use of this arm.
- Shoulder (right) has a torn Rotator Cuff, and is full of arthritis. The Cuff did not heal properly, and the arthritis is such that it allows a bone to slip out, which causes Crazy Pain, until it slips out.
- Heart Disease. I have had 2 heart attacks and have 3 stents implanted.
- Diabetes, which is fairly well controlled now with medication.
- High Blood Pressure. Difficult to control due to circulation problems
- Thyroid problems
- Depression-this is getting worse as the pain increases.

I take medication for all of the above, which is why I am a poor candidate for surgery.

NOTE: 18 years ago, I had breast cancer. Course of treatment was surgery, radiation and chemo. The chemo brought about severe nausea, pain, uncontrollable body sweats and disorientation. A friend of mine secured some marijuana as a last resort and it worked like a miracle. Nausea and pain became manageable. Finally getting some relief brought me out of a severe depression. I am thrilled to say that I am 18 years clean, but I was ready to stop the chemo because it was becoming unbearable. I credit marijuana with allowing me to finish my course of treatment...thus

saving my life.

I tell you this because it was such a positive experience. When treatment was over, I stopped the marijuana with no ill effects. I suffer deep depression now, due to constant pain that has almost turned me into a total shut-in. I am praying that marijuana can create another miracle in my life. I am only 68 years old, and don't want to turn my life over to pain.

9. Describe the extent to which evidence that is generally accepted among the medical community and other experts supports a finding that the use of marijuana alleviates suffering caused by the condition and/or the treatment thereof.

I am not sure what is generally accepted in the medical community. Enclosed please see the research I have done.

See attached articles

List of medications-see attached

10. See attached letters of support from my physicians

MEDICINAL MARIJUANA PETITION
(Continued)

10. Attach letters of support from physicians or other licensed health care professionals knowledgeable about the condition. List below the number of letters attached and identify the authors.

See attached

I certify, under penalty of perjury, that I am 18 years of age or older; that the information provided in this petition is true and accurate to the best of my knowledge; and that the attached documents are authentic.

Signature of Petitioner [redacted]	Date 8/29/16

Guirguis Medical Care, LLC
Nagy N. Guirguis, M.D.
301 Church St Aberdeen NJ, 07747
Tel: 732-566-0595 / 732-566-0996
Fax: 732-566-0597

August 15, 2015

Medicinal Marijuana Program
PO BOX 360
Trenton, NJ 08625-0360

ATTN Michelle Stark

Re; [redacted]

To Whom It May Concern,

[redacted] is patient of my office for many years [redacted] suffers from Back disease, Peripheral Vascular disease, CAD, Diabetes and broken shoulder . [redacted] is in significant chronic pain with no response to epidural and she is not a good candidate for surgery

If I can be any further assistance please don't hesitate to contact my office.

Dr. Nagy Guirguis

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1322 Route 72 • Manahawkin, New Jersey 08050 (609) 597-1377 • Fax (609) 597-0204
Interventional Pain Medicine • 1255 Route 70 • Lakewood, New Jersey 08701 (732) 942-2020 • Fax (732) 942-2021

+ * CARY D. GLASTEIN, M.D., F.A.C.S., F.A.A.O.S., F.A.A.S.S.
* LANCE A. MARKBREITER, M.D., F.A.C.S., F.A.A.O.S.
* CHARLES C. RIZZO, M.D., F.A.C.S., F.A.A.O.S.
+ * DAVID L. CHALNICK, M.D. F.A.C.S., F.A.A.O.S.
SCOTT C. WOSKA, M.D. F.A.A.P.M.R., F.A.A.E.M., D.A.B.P.M.
SANDEEP RATHI, M.D. F.A.A.P.M.R., D.A.B.P.M.

Orthopaedic Surgery
Sports Medicine
Scoliosis
Spinal Reconstruction Surgery
Total Joint Replacement and Revision
Foot and Ankle Surgery
Laser Surgery
Shoulder & Elbow Surgery
Interventional Pain Medicine
Electrodiagnostic Testing

August 12, 2016

Re: [redacted]

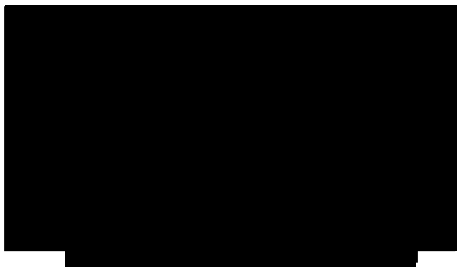
To Whom It May Concern:

[redacted] is a patient of mine. She has undergone four lumbar epidural steroid injections, dating back to 2011 with regards to low-back pain. She is in chronic pain. She has been prescribed short-acting opiates from time to time. More recently, she was prescribed a Duragesic patch for her pain. It is my impression that she is a candidate for medical marijuana. I believe this will prevent her from becoming a chronic opioid dependent patient. In my opinion, the side effects and risk factors of medical marijuana are significantly less when compared to chronic opioid use. She will need to be evaluated by a physician who prescribed medical marijuana, per the protocol, but from my perspective as an interventional pain management specialist, she is certainly a candidate.

Sincerely,

Sandeep Rathi, M.D.

SR/tssnj:kfs
Dictated but not read to avoid delay



August 29, 2016

1.	BUPROPION	150MG	ONCE DAILY
2.	INVOKANA	300MG	ONCE DAILY
3.	CRESTOR	5MG	ONCE DAILY
4.	CLOPIDOGREL	75MG	ONCE DAILY
5.	JANUVIA	100MG	ONCE DAILY
6.	ATENOLOL	25MG	ONCE DAILY
7.	LEVTHYROXINE	25MCG	ONCE DAILY
8.	LISINOPRIL	20MG	TWICE DAILY
9.	GLIMEPIRIDE	2MG	1/2 TAB ONCE DAILY
10.	CLONAZEPAM	0.5MG	TWICE DAILY
11.	ZOLOFT	50MG	ONCE DAILY
12.	LYRICA	75MG	TWICE DAILY
13.	OXYCOD/APAP TAB 5-325 MG		EVERY 12 HOURS AS NEEDED
14.	FENTANYL TRANSDERMAL		12 mcg every 72 hrs

ANTIHISTAMINE

Last updated on: 2/10/2016 12:59:05 PM PST

60 Peer-Reviewed Studies on Medical Marijuana

Medical Studies Involving Cannabis and Cannabis Extracts (1990 - 2014)

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Peer-reviewed studies on medical marijuana, listed by condition treated	# of Studies		
	Pro	Con	Not Clearly Pro or Con
ALS	1	0	0
Bipolar Disorder	2	0	0
Cancer	5	1	1
General Use	2	0	0
Glaucoma	0	0	1
HIV/AIDS	5	1	2
Huntington's Disease	0	0	1
IBD/Crohn's	1	0	1
Multiple Sclerosis	11	3	5
Nausea	1	0	0
Pain	6	0	1
Parkinson's Disease	2	0	1
PTSD	1	0	0
Psychosis / Schizophrenia	1	0	1
Rheumatoid Arthritis	1	0	0
Tourette's Syndrome	2	0	0
TOTALS	**41 (68.3%)**	**5 (8.3%)**	**14 (23.3%)**

Our list includes only peer-reviewed studies from 1990 to present that have been done using the marijuana plant or extracts derived from the plant, such as Sativex and Epidiolex. Studies involving synthetic reproductions of isolated compounds from the marijuana plant – e.g. products such as Marinol, Nabilone, Cannabinor, and others – were not included. Double-blind studies (in which neither the subjects nor the researchers know which patients are receiving the placebo or actual treatment) have been noted as such.

The studies are categorized as **Pro**, **Con**, or **Not Clearly Pro or Con** in relation to the specific purpose being investigated in the study. For example, a study showing a benefit of using marijuana to treat Multiple Sclerosis would be categorized as Pro. If the results were mixed, the study would be listed as **Not Clearly Pro or Con**. A study concluding that marijuana is not useful for treating the specific condition would be labeled Con.

We tried to find all the peer-reviewed studies related to testing the utility of marijuana in treating various health conditions since 1990, however we likely missed some. Despite our good faith efforts, please recognize that this list is neither exhaustive nor comprehensive.

ALS (Lou Gehrig's Disease)

1. ALS patients said marijuana provided appetite stimulation, aided sleep, relieved anxiety and depression, and provided muscle relaxation

PRO

Jacob Kaufman, MD, third year resident in the Department of Neurology at the University of Pennsylvania, et al., stated the following in their Apr. 29, 2014 study titled "Medical Marijuana Utilization and Perceived Therapeutic Value in Patients with ALS (P3.014)," published in *Neurology*:

"Cannabis has immunomodulatory [capable of regulating immune functions] properties and effects upon excitotoxicity [process by which neurons are damaged] that suggest that it might have a disease-modifying role in ALS [amyotrophic lateral sclerosis, aka Lou Gehrig's Disease]. There have also been some anecdotal reports suggesting that marijuana may be effective in alleviating certain ALS symptoms...

DESIGN/METHODS: We conducted an anonymous survey of all ALS patients attending the Penn ALS Center from June 2013 to the present...

RESULTS: The survey was given to 127 patients and 102 were completed (93% response rate). In total, 21% reported current or prior use of medical marijuana to treat their ALS symptoms. Of that 21%, large majorities considered it very effective in providing appetite stimulation (75%), aiding sleep (65%), relieving anxiety (80%), relieving depression (70%), and providing muscle relaxation (60%)...

CONCLUSIONS: Those of our patients currently using marijuana report a very significant treatment effect on many ALS symptoms."

Apr. 09, 2014 - Jacob Kaufman, MD

Return to Top

Bipolar Disorder

1. Bipolar patients who also had cannabis use disorder (CUD) had significantly better neurocognitive performance than those without CUD

PRO

Raphael J. Braga, MD, Assistant Professor of Psychiatry at Hofstra North Shore-LIJ School of Medicine, et al., stated the following in their May 2012 study titled "Cognitive and Clinical Outcomes Associated with Cannabis Use in Patients with Bipolar I Disorder," published in *Psychiatry Research*:

"The objective of the present study was to compare clinical and neurocognitive measures in individuals with bipolar disorder with a history of cannabis use disorder (CUD) versus those without a history of CUD...

Results from our analysis suggest that subjects with bipolar disorder and history of CUDs demonstrate significantly better neurocognitive performance, particularly on measures of attention, processing speed, and working memory...

These data could be interpreted to suggest that cannabis use may have a beneficial effect on cognitive functioning in patients with severe psychiatric disorders. However, it is also possible that these findings may be due to the requirement for a certain level of cognitive function and related social skills in the acquisition of illicit drugs."

May 2012 -Raphael J. Braga, MD ☆☆☆☆☆

2. Patients with bipolar disorder report that marijuana is more effective than conventional drugs.

PRO

Lester Grinspoon, MD, Professor of Psychiatry at the Harvard Medical School, et al., wrote in an Apr.-June 1998 article titled "The Use of Cannabis as a Mood Stabilizer in Bipolar Disorder: Anecdotal Evidence and the Need for Clinical Research" in *Journal of Psychoactive Drugs*:

"The authors present case histories indicating that a number of patients find cannabis (marihuana) useful in the treatment of their bipolar disorder. Some used it to treat mania, depression, or both. They stated that it was more effective than conventional drugs, or helped relieve the side effects of those drugs. One woman found that cannabis curbed her manic rages; she and her husband have worked to make it legally available as a medicine. Others described the use of cannabis as a supplement to lithium (allowing reduced consumption) or for relief of lithium's side effects. Another case illustrates the fact that medical cannabis users are in danger of arrest, especially when children are encouraged to inform on parents by some drug prevention programs.

An analogy is drawn between the status of cannabis today and that of lithium in the early 1950s, when its effect on mania had been discovered but there were no controlled studies. In the case of cannabis, the law has made such studies almost impossible, and the only available evidence is anecdotal. The potential for cannabis as a treatment for bipolar disorder unfortunately can not be fully explored in the present social circumstances."

Apr.-June 1998 - Lester Grinspoon, MD ☆☆☆☆

Return to Top

Cancer

1. Cannabidiol inhibits proliferation of breast cancer cells

PRO

Sean D. McAllister, PhD, Scientist at California Pacific Medical Center Research Institute, et al., stated the following in their Aug. 2011 study titled "Pathways Mediating the Effects of Cannabidiol on the Reduction of Breast Cancer Cell Proliferation, Invasion, and Metastasis," published in *Breast Cancer Research and Treatment* journal:

"There is a general consensus in the field of cancer research that targeting multiple pathways that control tumor progression is the best strategy for the eradication of aggressive cancers. Since CBD has a low toxicity, it would be an ideal candidate for use in combination treatments with additional drugs already used in the clinic. Importantly, CBD appears to be interacting through a cellular system that regulates the expression of key transcriptional factors (e.g., Id-1) that control breast cancer cell proliferation, migration, and invasion. The experiments described in this manuscript not only define the pathways that CBD is working through to control breast cancer cell aggressiveness, but also demonstrate the efficacy of CBD in pre-clinical models. A greater understanding of this system may lead to future therapies for breast cancer patients, including the additional refinement of CBD analog synthesis."
Aug. 2011 - Sean D. McAllister, PhD

[Editor's Note: The CBD was acquired from the National Institute of Health through the National Institute of Drug Abuse. CBD was extracted from marijuana plants grown at the University of Mississippi.]

2. Cannabis-based medicine protected against chemotherapy-induced nausea and vomiting

PRO

Marta Duran, MD, Clinical Pharmacologist in the Fundació Institut Català de Farmacologia at the Universitat Autònoma de Barcelona, et al., stated the following in their Nov. 2010 study titled "Preliminary Efficacy and Safety of an Oromucosal Standardized Cannabis Extract in Chemotherapy-Induced Nausea and Vomiting," published in the *British Journal of Clinical Pharmacology*:

"AIMS: Despite progress in anti-emetic treatment, many patients still suffer from chemotherapy-induced nausea and vomiting (CINV). This is a pilot, randomized, double-blind, placebo-controlled phase II clinical trial designed to evaluate the tolerability, preliminary efficacy, and pharmacokinetics of an acute dose titration of a whole-plant cannabis-based medicine (CBM) containing delta-9-tetrahydrocannabinol and cannabidiol, taken in conjunction with standard therapies in the control of CINV.

METHODS: Patients suffering from CINV despite prophylaxis with standard anti-emetic treatment were randomized to CBM or placebo, during the 120 h post-chemotherapy period, added to standard anti-emetic treatment...

CONCLUSION: Compared with placebo, CBM added to standard antiemetic therapy was well tolerated and provided better protection against delayed CINV. These results should be confirmed in a phase III clinical trial."
Nov. 2010 - Marta Duran, MD

Double-Blind Study

3. Cannabidiol (THC:CBD) extract relieved pain in patients with advanced cancer

PRO

Jeremy R. Johnson, MBChB, former Medical Director at the Shropshire and Mid Wales Severn Hospice, et. al, wrote the following in a Nov. 6 2009 article titled "Multicenter, Double-Blind, Randomized, Placebo-Controlled, Parallel-Group Study of the Efficacy, Safety, and Tolerability of THC:CBD Extract and THC Extract in Patients with Intractable Cancer-Related Pain," published on the *Journal of Pain and Symptom Management* website:

"The primary analysis of change from baseline in mean pain Numerical Rating Scale (NRS) score was statistically significantly in favor of THC:CBD compared with placebo...

Conclusion
This study shows that THC:CBD extract is efficacious for relief of pain in patients with advanced cancer pain not fully relieved by strong opioids."
Nov. 6, 2009 - Jeremy R. Johnson, MBChB ☆☆☆☆

Double-Blind Study

4. Cannabis extract (CE) and THC were well-tolerated, but no differences in appetite or quality of life were found at the doses investigated

NC

Florian Strasser, MD, Assistant Medical Director of the Swiss Society of Palliative Care et al., wrote in a July 2006 article titled "Comparison of Orally Administered Cannabis Extract and Delta-9-Tetrahydrocannabinol in Treating Patients with Cancer-Related Anorexia-Cachexia Syndrome: A Multicenter, Phase III, Randomized, Double-Blind, Placebo-Controlled Clinical Trial from the Cannabis-in-Cachexia-Study-Group" in the *Journal of Clinical Oncology*:

"PURPOSE: To compare the effects of cannabis extract (CE), delta-9-tetrahydrocannabinol (THC), and placebo (PL) on appetite and quality of life (QOL) in patients with cancer-related anorexia-cachexia syndrome (CACS)...

CONCLUSION: CE at the oral dose administered was well tolerated by these patients with CACS. No differences in patients' appetite or QOL were found either between CE, THC, and PL or between CE and THC at the dosages investigated."
July 2006 - Florian Strasser, MD ☆☆☆☆

Double-Blind Study

5. Cannabinoids have pain relieving effect in cancer patients and may inhibit the growth of tumor cells

PRO

Manuel Guzman, PhD, Professor of Biochemistry and Molecular Biology at Madrid Complutense University, stated the following in his Oct. 2003 article titled "Cannabinoids: Potential Anticancer Agents," published in the journal *Nature Reviews - Cancer*:

> "Cannabinoids – the active components of Cannabis sativa and their derivatives – exert palliative effects in cancer patients by preventing nausea, vomiting and pain and by stimulating appetite.
>
> In addition, these compounds have been shown to inhibit the growth of tumour cells in culture and animal models by modulating key cell-signaling pathways.
>
> Cannabinoids are usually well tolerated, and do not produce the generalized toxic effects of conventional chemotherapies."

Oct. 2003 - Manuel Guzman, PhD

6. A review does not find persuasive evidence to recommend marijuana for preventing vomiting in cancer patients

CON

Richard H. Schwartz, MD, Clinical Professor of Pediatrics at Georgetown University, Eric A. Voth, MD, Chairman of the Institute on Global Drug Policy, et al., wrote the following in their Feb. 1997 article titled "Marijuana to Prevent Nausea and Vomiting in Cancer Patients: A Survey of Clinical Oncologists" in the *Southern Medical Journal*:

> "Marijuana, if rescheduled by the Drug Enforcement Agency, would be the only Food and Drug Administration (FDA)-approved drug to be administered by smoking. American physicians need timely, factual information about probable usage patterns and potential adverse effects of medical marijuana, and a factual complete review of the literature on the subject.
>
> We mailed a survey to 1,500 American clinical oncologists. Of particular interest was whether and how often in the past 24 months these physicians recommended smoked marijuana, synthetic tetrahydrocannabinol, or 5-HT3 (serotonin) antagonists (ondansetron [Zofran], granisetron [Kytril]) for their patients. We also inquired whether and how often the oncologists would prescribe marijuana in the form of cigarettes, were it to be FDA-approved. Completed surveys were received from 1,122 (75%) of the oncologists.
>
> The percentages of oncologists who prescribed or recommended selected antiemetics more than five times between 1992 and 1994 were 98% for 5-HT, antagonists, 6% for dronabinol (Marinol), and 1% for smoked marijuana. We also found that 332 (30%) of the oncologist-respondents to this nationwide survey supported rescheduling of marijuana for medical purposes; however, two thirds (67%) of the 332 respondents who were in favor of rescheduling estimated that they would write less than one prescription per month for marijuana cigarettes. A comprehensive literature review failed to provide persuasive evidence to recommend marijuana as a needed antiemetic medicine."

Feb. 1997 - Richard H. Schwartz, MD ☆☆☆☆ Eric Voth, MD ☆☆☆☆

7. Oncologists have favorable opinions on the use of marijuana to prevent vomiting in cancer chemotherapy patients

PRO

Rick Doblin, PhD, President of the Multidisciplinary Association for Psychedelic Studies (MAPS), and Mark A. R. Kleiman, PhD, Professor of Public Policy at the UCLA School of Public Affairs, wrote in a July 1991 article titled "Marijuana as Antiemetic Medicine: A Survey of Oncologists' Experiences and Attitudes" in the *American Journal of Clinical Oncology*:

> "A random-sample, anonymous survey of the members of the American Society of Clinical Oncology (ASCO) was conducted in spring 1990 measuring the attitudes and experiences of American oncologists concerning the antiemetic use of marijuana in cancer chemotherapy patients. The survey was mailed to about one third (N = 2,430) of all United States-based ASCO members and yielded a response rate of 43% (1,035).
>
> More than 44% of the respondents report recommending the (illegal) use of marijuana for the control of emesis to at least one cancer chemotherapy patient. Almost one half (48%) would prescribe marijuana to some of their patients if it were legal. As a group, respondents considered smoked marijuana to be somewhat more effective than the legally available oral synthetic dronabinol ([THC] Marinol; Unimed, Somerville, NJ) and roughly as safe. Of the respondents who expressed an opinion, a majority (54%) thought marijuana should be available by prescription.
>
> These results bear on the question of whether marijuana has a 'currently accepted medical use,' at issue in an ongoing administrative and legal dispute concerning whether marijuana in smoked form should be available by prescription along with synthetic THC in oral form. This survey demonstrates that oncologists' experience with the medical use of marijuana is more extensive, and their opinions of it are more favorable, than the regulatory authorities appear to have believed."

July 1991 - Rick Doblin, PhD ☆☆☆ Mark A. R. Kleiman, PhD ☆☆☆

Return to Top

General Use

1. Cannabis extracts improved intractable neurogenic symptoms such as pain, impaired bladder control, muscle spasms, and spasticity

PRO

Derick T. Wade, MD, Professor in the Department of Clinical Neurology at the University of Oxford, et al., wrote in a Feb. 2003 article titled "A Preliminary Controlled Study to Determine Whether Whole-Plant Cannabis Extracts Can Improve Intractable Neurogenic Symptoms" in the journal *Clinical Rehabilitation*:

> "OBJECTIVES: To determine whether plant-derived cannabis medicinal extracts (CME) can alleviate neurogenic symptoms unresponsive to standard treatment, and to quantify adverse effects...

Measures used: Patients recorded symptom, well-being and intoxication scores on a daily basis using visual analogue scales. At the end of each two-week period an observer rated severity and frequency of symptoms on numerical rating scales, administered standard measures of disability (Barthel Index), mood and cognition, and recorded adverse events.

RESULTS: Pain relief associated with both THC and CBD was significantly superior to placebo. Impaired bladder control, muscle spasms and spasticity were improved by CME in some patients with these symptoms. Three patients had transient hypotension and intoxication with rapid initial dosing of THC-containing CME.

CONCLUSIONS: Cannabis medicinal extracts can improve neurogenic symptoms unresponsive to standard treatments. Unwanted effects are predictable and generally well tolerated. Larger scale studies are warranted to confirm these findings."

Feb. 2003 - Derick T. Wade, MD ☆☆☆☆☆

Double-Blind Study

2. Marijuana use helps the Compassionate Investigational New Drug (IND) program patients remain stable and take fewer pharmaceutical drugs

PRO

Ethan Russo, MD, Senior Medical Advisor at the Cannabinoid Research Institute, et al., stated in his study of four of the remaining seven legal medical marijuana patients in the Compassionate IND program, titled "Chronic Cannabis Use in the Compassionate Investigational New Drug Program: An Examination of Benefits and Adverse Effects of Legal Clinical Cannabis," and published in the Jan. 2002 edition of the *Journal of Cannabis Therapeutics*:

"The aim of this study is to examine the overall health status of 4 of the 7 surviving patients in the [Compassionate IND] program. This project provides the first opportunity to scrutinize the long-term effects of cannabis on patients who have used a known dosage of a standardized, heat-sterilized quality-controlled supply of low-grade marijuana for 11 to 27 years.

Results demonstrate clinical effectiveness in these patients in treating glaucoma, chronic musculoskeletal pain, spasm and nausea, and spasticity of multiple sclerosis. All 4 patients are stable with respect to their chronic conditions, and are taking many fewer standard pharmaceuticals than previously.

Mild changes in pulmonary function were observed in 2 patients, while no functionally significant attributable sequelae were noted in any other physiological system examined in the study, which included: MRI scans of the brain, pulmonary function tests, chest X-ray, neuropsychological tests, hormone and immunological assays, electroencephalography, P300 testing, history, and neurological clinical examination.

These results would support the provision of clinical cannabis to a greater number of patients in need. We believe that cannabis can be a safe and effective medicine with various suggested improvements in the existing Compassionate IND program."

Jan. 2002 - Ethan Russo, MD ☆☆☆☆☆

Return to Top

Glaucoma

1. Sublingual (under the tongue) doses of THC and CBD produced mixed results when used to treat intraocular pressure (IOP)

NC

Ileana Tomida, MD, Ophthalmology Specialist, et al. wrote in an Oct. 2006 article titled "Effect of Sublingual Application of Cannabinoids on Intraocular Pressure: A Pilot Study" in the *Journal of Glaucoma*:

"PURPOSE: The purpose of this study was to assess the effect on intraocular pressure (IOP) and the safety and tolerability of oromucosal administration of a low dose of delta-9-tetrahydrocannabinol (Delta-9-THC) and cannabidiol (CBD)...
CONCLUSIONS: A single 5 mg sublingual dose of Delta-9-THC reduced the IOP temporarily and was well tolerated by most patients. Sublingual administration of 20 mg CBD did not reduce IOP, whereas 40 mg CBD produced a transient increase IOP rise."

Oct. 2006 - Ileana Tomida, MD ☆☆☆☆☆

Double-Blind Study

Return to Top

HIV/AIDS

1. Smoked cannabis relieved neuropathic pain in patients with HIV

PRO

Ronald J. Ellis, MD, PhD, Professor In Residence in the Department of Neuroscience at the University of California at San Diego, et al., stated the following in their Aug. 2008 study titled "Smoked Medicinal Cannabis for Neuropathic Pain in HIV: A Randomized, Crossover Clinical Trial," published in *Neuropsychopharmacology*:

"In a double-blind, randomized, clinical trial of the short-term adjunctive treatment of neuropathic pain in HIV-associated distal sensory polyneuropathy, participants received either smoked cannabis or placebo cannabis

cigarettes...

Among completers, pain relief was significantly greater with cannabis than placebo. The proportion of subjects achieving at least 30% pain relief was again significantly greater with cannabis (46%) compared to placebo (18%). It was concluded that smoked cannabis was generally well-tolerated and effective when added to concomitant analgesic therapy in patients with medically refractory pain due to HIV-associated neuropathy."

Aug. 2003 - Ronald J. Ellis, MD, PhD ☆☆☆☆

Double-Blind Study

2. Marijuana use produced substantial increase in food intake among HIV-positive patients

PRO

Margaret Haney, PhD, Associate Professor of Clinical Neuroscience at Columbia University, et al., wrote the following in their Aug. 15, 2007 study titled "Dronabinol and Marijuana in HIV-Positive Marijuana Smokers: Caloric Intake, Mood, and Sleep," published in the *Journal of Acquired Immune Deficiency Syndromes*:

"Objectives: This placebo-controlled within-subjects study evaluated marijuana and dronabinol across a range of behaviors: eating topography, mood, cognitive performance, physiologic measures, and sleep.

Methods: HIV-positive marijuana smokers (n = 10) completed 2 16-day inpatient phases. Each dronabinol (5 and 10 mg) and marijuana (2.0% and 3.9% [DELTA]9-tetrahydrocannabinol [THC]) dose was administered 4 times daily for 4 days, but only 1 drug was active per day, thereby maintaining double-blind dosing. Four days of placebo washout separated each active cannabinoid condition.

Results: As compared with placebo, marijuana and dronabinol dose dependently increased daily caloric intake and body weight in HIV-positive marijuana smokers. All cannabinoid conditions produced significant intoxication, except for low-dose dronabinol (5 mg); the intoxication was rated positively (eg, "good drug effect") with little evidence of discomfort and no impairment of cognitive performance. Effects of marijuana and dronabinol were comparable, except that only marijuana (3.9% THC) improved ratings of sleep.

Conclusions: These data suggest that for HIV-positive marijuana smokers, both dronabinol (at doses 8 times current recommendations) and marijuana were well tolerated and produced substantial and comparable increases in food intake."

Aug. 15, 2007 - Margaret Haney, PhD ☆☆☆

3. Smoked cannabis relieved chronic neuropathic pain in patients with HIV

PRO

Donald Abrams, MD, Professor of Clinical Medicine at the University of California at San Francisco, et al., wrote in his Feb. 13, 2007 article titled "Cannabis in Painful HIV-Associated Sensory Neuropathy: A Randomized Placebo-Controlled Trial" in the journal *Neurology*:

"Objective: To determine the effect of smoked cannabis on the neuropathic pain of HIV-associated sensory neuropathy, and an experimental pain model...
Patients were randomly assigned to smoke either cannabis (3.56% thc) or identical placebo cigarettes with the cannabinoids extracted three times daily for 5 days...

Conclusion: Smoked cannabis was well tolerated and effectively relieved chronic neuropathic pain from HIV-associated sensory neuropathy. The findings are comparable to oral drugs used for chronic neuropathic pain."

Feb. 13, 2007 - Donald Abrams, MD ☆☆☆☆

Double-Blind Study

4. Smoking marijuana reduced chronic neuropathic pain in HIV patients

PRO

Donald Abrams, MD, Professor of Clinical Medicine at the University of California, San Francisco, et al., wrote in their 2005 meeting abstract "Smoked Cannabis Therapy for HIV-related Painful Peripheral Neuropathy: Results of a Randomized, Placebo-controlled Clinical Trial," published in the *Journal of the International Association for Cannabis as Medicine*:

"Smoked marijuana is effective in reducing chronic ongoing neuropathic pain as well as acute pain in the experimental pain model. The magnitude of the response of the neuropathic pain is similar to what is seen with gabapentin, a widely used therapeutic intervention for HIV neuropathy."

2005 - Donald Abrams, MD ☆☆☆☆

5. HIV patients report that marijuana helps relieve anxiety and depression, improved appetite, relieved pain, and more

NC

Diane Prentiss, MA, MPH, et al., wrote the following in their article titled "Patterns of Marijuana Use Among Patients with HIV/AIDS Followed in a Public Health Care Setting," published in the Jan. 2004 issue of *Journal of Acquired Immune Deficiency Syndromes* (JAIDS):

"Objectives: To examine prevalence and patterns of smoked marijuana and perceived benefit and to assess demographic and clinical factors associated with marijuana use among HIV patients in a public health care setting...

Results: Overall prevalence of smoked marijuana in the previous month was 23%. Reported benefits included relief of anxiety and/or depression (57%), improved appetite (53%), increased pleasure (33%), and relief of pain (28%). Recent use of marijuana was positively associated with severe nausea and recent use of alcohol and negatively associated with being Latino.

Conclusions: The findings suggest that providers be advised to assess routinely and better understand patients' indications for self-administration of cannabis. Given the estimated prevalence, more formal characterization of the patterns and impact of cannabis use to alleviate HIV-associated symptoms is warranted. Clinical trials of smoked and noncombustible marijuana are needed to determine the role of cannabinoids as a class of agents with potential to improve quality of life and health care outcomes among patients with HIV/AIDS."

Jan. 2004 - Diane Prentiss, MPH

6. HIV patients using marijuana in smoked and pill forms have improved immune function

PRO

Donald Abrams, MD, Professor of Clinical Medicine at the University of California, San Francisco, et al., wrote the following in their article "Short-term Effects of Cannabinoids in Patients with HIV-1 Infection: A Randomized, Placebo-controlled Clinical Trial," published Aug. 2003 in the journal *Annals of Internal Medicine*:

"Conclusions: Smoked and oral cannabinoids [marijuana] did not seem to be unsafe in people with HIV infection with respect to HIV RNA levels, CD4 and CD8 cell counts, or protease inhibitor levels over a 21-day treatment."

The accompanying "Summaries For Patients" provided by the journal stated:

"Patients receiving cannabinoids [smoked marijuana and marijuana pills] had improved immune function compared with those receiving placebo. They also gained about 4 pounds more on average than those patients receiving placebo."

Aug. 2003 - Donald Abrams, MD ☆☆☆☆

7. Marijuana use may cause lung problems and regular use could harm HIV patients

CON

Donald P. Tashkin, MD, Director of the Pulmonary Function Laboratories at UCLA, stated the following in his June 2001 article titled "Effects of Smoked Marijuana on the Lung and Its Immune Defenses: Implications for Medicinal Use in HIV-Infected Patients," published in *Journal of Cannabis Therapeutics*:

"Frequent marijuana use can cause airway injury, lung inflammation and impaired pulmonary defense against infection. The major potential pulmonary consequences of habitual marijuana use of particular relevance to patients with AIDS is superimposed pulmonary infection, which could be life threatening in the seriously immunocompromised patient.

In view of the immunosuppressive effect of THC, the possibility that regular marijuana use could enhance progression of HIV infection itself needs to be considered, although this possibility remains unexplored to date."

June 2001 - Donald P. Tashkin, MD ☆☆☆☆

8. Cell culture studies show marijuana lowers resistance to infection, but human studies are required to determine long-term consequences

NC

Guy A. Cabral, PhD, stated the following in his June 2001 article titled "Marijuana and Cannabinoids: Effects on Infections, Immunity, and AIDS," published in *Journal of Neurology*:

"The cumulative data obtained through cell culture studies using various immune cell populations extracted from animals or humans, together with those obtained using animal models of infection, are consistent with the proposition that marijuana and cannabinoids alter immune cell function and can exert deleterious effects on resistance to infection in humans....

However, few controlled longitudinal epidemiological and immunological studies have been undertaken to correlate the immunosuppressive effects of marijuana smoke or cannabinoids on the incidence of infections or viral disease in humans.

Clearly, additional investigation to resolve the long-term immunological consequences of cannabinoid and marijuana use as they relate to resistance to infections in humans is warranted."

June 2001 - Guy A. Cabral, PhD

Return to Top

Huntington's Disease

1. CBD found to be nontoxic but ineffective at reducing Huntington's Disease symptoms

NC

Paul F. Consroe, PhD, Professor Emeritus in the Department of Pharmacology and Toxicology at the University of Arizona, et al., wrote the following in their Nov. 1991 article titled "Controlled Clinical Trial of Cannabidiol in Huntington's Disease," published in the journal *Pharmacology, Biochemistry and Behavior*:

"Based on encouraging preliminary findings, cannabidiol (CBD), a major nonpsychotropic constituent of Cannabis, was evaluated for symptomatic efficacy and safety in 15 neuroleptic-free patients with Huntington's Disease (HD). The effects of oral CBD (10 mg/kg/day for 6 weeks) and placebo (sesame oil for 6 weeks) were ascertained weekly under a double-blind, randomized cross-over design...

In summary, CBD, at an average daily dose of about 700 mg/day for 6 weeks, was neither symptomatically effective nor toxic, relative to placebo, in neuroleptic-free patients with HD."
Nov 1991 - Paul F. Consroe, PhD ☆☆☆

Double-Blind Study

Inflammatory Bowel Disease (IBD)/Crohn's Disease

1. Cannabis improved IBD symptoms, but patients with Crohn's Disease (a type of IBD) who used cannabis had a higher risk of needing surgery

NC

Martin Storr, MD, Associate Professor in the Department of Medicine at the University of Calgary, et al., stated the following in their Mar. 2014 article titled "Cannabis Use Provides Symptom Relief in Patients with Inflammatory Bowel Disease but Is Associated with Worse Disease Prognosis in Patients with Crohn's Disease," published in *Inflammatory Bowel Diseases*:

"Methods: Consecutive patients with IBD (n = 313) seen in the University of Calgary from July 2008 to March 2009 completed a structured anonymous questionnaire covering motives, pattern of use, and subjective beneficial and adverse effects associated with self-administration of Cannabis...

Results: Cannabis had been used by 17.6% of respondents specifically to relieve symptoms associated with their IBD, the majority by inhalational route (96.4%). Patients with IBD reported that Cannabis improved abdominal pain (83.9%), abdominal cramping (76.8%), joint pain (48.2%), and diarrhea (28.6%), although side effects were frequent. The use of Cannabis for more than 6 months at any time for IBD symptoms was a strong predictor of requiring surgery in patients with Crohn's disease...

Conclusions: Cannabis use is common in patients with IBD and subjectively improved pain and diarrheal symptoms. However, Cannabis use was associated with higher risk of surgery in patients with Crohn's disease. Patients using Cannabis should be cautioned about potential harm, until clinical trials evaluate efficacy and safety."
Mar 2014 - Martin Storr, MD

2. Cannabis cigarettes produced significant clinical benefits with no side effects in 10 of 11 Crohn's Disease patients

PRO

Timna Naftali, MD, Specialist in Gastroenterology at Meir Hospital and Kupat Holim Clinic (Israel), et al., stated the following in their Oct. 2013 study titled "Cannabis Induces a Clinical Response in Patients with Crohn's Disease: A Prospective Placebo-Controlled Study," published in *Clinical Gastroenterology and Hepatology*:

"BACKGROUND & AIMS: [...]We performed a prospective trial to determine whether cannabis can induce remission in patients with Crohn's disease.

METHODS: We studied 21 patients... with Crohn's Disease Activity Index (CDAI) scores greater than 200 who did not respond to therapy with steroids, immunomodulators, or anti-tumor necrosis factor-alpha agents. Patients were assigned randomly to groups given cannabis, twice daily, in the form of cigarettes containing 115 mg of delta 9-tetrahydrocannabinol (THC) or placebo containing cannabis flowers from which the THC had been extracted. Disease activity and laboratory tests were assessed during 8 weeks of treatment and 2 weeks thereafter.

RESULTS: Complete remission... was achieved by 5 of 11 subjects in the cannabis group (45%) and 1 of 10 in the placebo group (10%). A clinical response... was observed in 10 of 11 subjects in the cannabis group (90%) and 4 of 10 in the placebo group (40%). Three patients in the cannabis group were weaned from steroid dependency. Subjects receiving cannabis reported improved appetite and sleep, with no significant side effects.

CONCLUSIONS: Although the primary end point of the study (induction of remission) was not achieved, a short course (8 weeks) of THC-rich cannabis produced significant clinical, steroid-free benefits to 10 of 11 patients with active Crohn's disease, compared with placebo, without side effects."
Oct 2013 - Timna Naftali, MD ☆☆☆☆

Return to Top

Multiple Sclerosis (MS)

1. Sativex reduced spasticity in MS patients

PRO

Peter Flachenecker, MD, Head of the Quellenhof Neurological Rehabilitation Center, et al., stated the following in their June 2014 study titled "Long-Term Effectiveness and Safety of Nabiximols (Tetrahydrocannabinol/Cannabidiol Oromucosal Spray) in Clinical Practice," published in *European Neurology:*

"Background: Nabiximols (Sativex), in a cannabinoid-based oromucosal spray, is an add-on therapy option for patients with moderate to severe multiple sclerosis spasticity (MSS) resistant to other medications. The study objective was to provide long-term data on clinical outcomes, tolerability, quality of life and treatment satisfaction

for MSS patients receiving nabiximols in routine care.

Results: In total, 52 patients were included in the effectiveness analysis after 12 months. The mean spasticity numerical rating scale (NRS, 0-10) score decreased significantly... The majority of patients (84%) did not report adverse events.

Conclusion: Real-life data confirm the long-term effectiveness and tolerability of nabiximols for the treatment of resistant MSS in everyday clinical practice."
June 2014 - Peter Flachenecker, MD

2. MS patients using cannabis reported more fatigue, numbness, tingling or pain, and heat sensitivity, and said they were "more disabled"

NC

Tamela Stuchiner, MA, Research Analyst at the Providence Brain and Spine Institute, et al., stated the following in their Apr. 8, 2014 study titled "Use of Medical Marijuana for Symptoms of Multiple Sclerosis (MS) among Participants of the Pacific Northwest MS Registry," published in *Neurology*:

"A survey including demographic information, symptoms, disability status, quality of life, use of MS [multiple sclerosis] medications, and alternative therapies in persons 18 or older with MS, was mailed to registry participants in 2013...

RESULTS: Sixty-six percent (n=1,283) of surveys were returned. Of those responding, 8.3% (n=107) reported currently using cannabis to treat MS symptoms... Fatigue; numbness, tingling or pain; and heat sensitivity were more prevalent among cannabis users. Cannabis users reported being more disabled... and had worse physical and psychological impact scores...

CONCLUSIONS: Results showed that users of cannabis for symptom management reported more disabling symptoms and higher impact of MS on quality of life. This illustrates the need for more options to be provided in the management of MS symptoms."
Apr. 8, 2014 - Tamela Stuchiner, MA

[Editor's Note: We had originally classified this study as "Con" based on the conclusions, but in a Feb. 10, 2016 email to ProCon.org, study author Tamela Stuchiner explained why the results are "Not Clearly Pro or Con," stating:

"This was a cross-sectional, descriptive analysis in of those persons in our MS population who reported using cannabis for their MS symptoms. As this is what was reported at one point in time, there is no way to know if the cannabis made their symptoms worse. What we did find is that those using cannabis at that time reported the occurrence of some symptoms more than others. This suggests further study is needed. We plan a sub-study for those reporting use of cannabis to determine a relationship. But at this time, no negative relationship can be reported from this data. It is inconclusive."]

3. Conflicting findings on use of Sativex for MS central neuropathic pain

NC

Richard Langford, MD, Professor of Anaesthesia & Pain Medicine at Barts Health NHS Trust, et al., stated the following in their Apr. 2013 study titled "A Double-blind, Randomized, Placebo-controlled, Parallel-group Study of THC/CBD Oromucosal Spray in Combination with the Existing Treatment Regimen, in the Relief of Central Neuropathic Pain in Patients with Multiple Sclerosis," published in the *Journal of Neurology*:

"Central neuropathic pain (CNP) occurs in many multiple sclerosis (MS) patients... Here we report the first phase III placebo-controlled study of the efficacy of the endocannabinoid system modulator delta-9-tetrahydrocannabinol (THC)/cannabidiol (CBD) oromucosal spray (USAN name, nabiximols; Sativex, GW Pharmaceuticals, Salisbury, Wiltshire, UK), to alleviate CNP. Patients who had failed to gain adequate analgesia from existing medication were treated with THC/CBD spray or placebo as an add-on treatment, in a double-blind manner, for 14 weeks to investigate the efficacy of the medication in MS-induced neuropathic pain...

The results of the current investigation were equivocal, with conflicting findings in the two phases of the study. While there were a large proportion of responders to THC/CBD spray treatment during the phase A double-blind period, the primary endpoint was not met due to a similarly large number of placebo responders. In contrast, there was a marked effect in phase B of the study, with an increased time to treatment failure in the THC/CBD spray group compared to placebo. These findings suggest that further studies are required to explore the full potential of THC/CBD spray in these patients."
Apr. 2013 - Richard Langford, MD

Double-Blind Study

4. Cannabis extract relieved muscle stiffness in patients with MS

PRO

John P. Zajicek, PhD, Professor of Clinical Neuroscience at the Neurology Research and Clinical Trials Unit of the Peninsula Medical School at the University of Plymouth, et al., wrote the following in a Nov. 2012 study titled "Multiple Sclerosis and Extract of Cannabis: Results of the MUSEC Trial," published in the *Journal of Neurology, Neurosurgery & Psychiatry*:

"**OBJECTIVE:** Multiple sclerosis (MS) is associated with chronic symptoms, including muscle stiffness, spasms, pain and insomnia. Here we report the results of the Multiple Sclerosis and Extract of Cannabis (MUSEC) study that aimed to substantiate the patient based findings of previous studies.

PATIENTS AND METHODS: Patients with stable MS at 22 UK centres were randomised to oral cannabis extract (CE) (N=144) or placebo (N=135)... This double blind, placebo controlled, phase III study had a screening

period, a 2 week dose titration phase from 5 mg to a maximum of 25 mg of tetrahydrocannabinol daily and a 10 week maintenance phase...

RESULTS: The rate of relief from muscle stiffness after 12 weeks was almost twice as high with CE than with placebo...

CONCLUSION: The study met its primary objective to demonstrate the superiority of CE over placebo in the treatment of muscle stiffness in MS. This was supported by results for secondary efficacy variables. Adverse events in participants treated with CE were consistent with the known side effects of cannabinoids. No new safety concerns were observed."

Nov 2012 - John P. Zajicek, PhD ☆☆☆

Double-Blind Study

5. Smoked cannabis helped with symptom and pain reduction in MS patients

PRO

Jody Corey-Bloom, PhD, Professor of Neurosciences at the University of California at San Diego, et al., stated the following in their May 2012 study titled "Smoked Cannabis for Spasticity in Multiple Sclerosis: A Randomized, Placebo-Controlled Trial," published in the *Canadian Medical Association Journal*:

"**Methods:** We conducted a placebo-controlled, crossover trial involving adult patients with multiple sclerosis and spasticity...

Results: Thirty-seven participants were randomized at the start of the study, 30 of whom completed the trial. Treatment with smoked cannabis resulted in a reduction in patient scores on the modified Ashworth scale by an average of 2.74 points more than placebo ($p < 0.0001$). In addition, treatment reduced pain scores on a visual analogue scale by an average of 5.28 points more than placebo ($p = 0.008$). Scores for the timed walk did not differ significantly between treatment and placebo ($p = 0.2$). Scores on the Paced Auditory Serial Addition Test decreased by 8.67 points more with treatment than with placebo ($p = 0.003$). No serious adverse events occurred during the trial.

Interpretation: Smoked cannabis was superior to placebo in symptom and pain reduction in participants with treatment-resistant spasticity. Future studies should examine whether different doses can result in similar beneficial effects with less cognitive impact."

May 2012 - Jody Corey-Bloom, PhD

6. MS patients using cannabis had significantly poorer cognitive skills and were twice as likely to be globally cognitively impaired

CON

Anthony Feinstein, PhD, MD, Professor of Psychiatry at the University of Toronto, et al., wrote in their Mar. 29, 2011 article "Effects of Cannabis on Cognitive Function in Patients with Multiple Sclerosis" in *Neurology*:

"Given that MS is associated with cognitive deterioration, the aim of this study was to determine the neuropsychological effects of cannabis use in this population.

Results: Cannabis users performed significantly more poorly than nonusers on measures of information processing speed, working memory, executive functions, and visuospatial perception. They were also twice as likely as nonusers to be classified as globally cognitively impaired."

Mar. 29, 2011 -Anthony Feinstein, PhD, MD ☆☆☆☆

7. Sativex improved spasticity caused by MS

PRO

Alena Novotna, MD, et al., stated the following in their Mar. 1, 2011 study titled "A Randomized, Double-blind, Placebo-controlled, Parallel-group, Enriched-design Study of Nabiximols (Sativex), as Add-on Therapy, in Subjects with Refractory Spasticity Caused by Multiple Sclerosis," published in the *European Journal of Neurology*:

"Spasticity is a disabling complication of multiple sclerosis, affecting many patients with the condition. Subjects were treated with nabiximols [Sativex], as add-on therapy, in a single-blind manner... This study has shown Sativex to improve spasticity in patients who had failed to respond adequately to other antispasticity medications..."

Mar. 1, 2011 -Alena Novotna, MD ☆☆☆☆

Double-Blind Study

8. Sativex improved spasticity caused by MS

PRO

Jeremy R. Johnson, MD, former Medical Director at the Shropshire and Mid Wales Severn Hospice, et al., stated the following in their Nov. 5, 2009 study titled "Multicenter, Double-Blind, Randomized, Placebo-Controlled, Parallel-Group Study of the Efficacy, Safety, and Tolerability of THC:CBD Extract and THC Extract in Patients with Intractable Cancer-Related Pain," published in the *Journal of Pain and Symptom Management*:

"This study compared the efficacy of a tetrahydrocannabinol:cannabidiol (THC:CBD) extract, a nonopioid analgesic endocannabinoid system modulator, and a THC extract, with placebo, in relieving pain in patients with advanced cancer. In total, 177 patients with cancer pain, who experienced inadequate analgesia despite chronic opioid dosing, entered a two-week, multicenter, double-blind, randomized, placebo-controlled, parallel-group trial...

Twice as many patients taking THC:CBD showed a reduction of more than 30% from baseline pain NRS score when compared with placebo (23 [43%] vs. 12 [21%])... This study shows that THC:CBD extract is efficacious for relief of pain in patients with advanced cancer pain not fully relieved by strong opioids."

Nov. 8, 2005 - Jeremy R. Johnson, MD ☆☆☆☆

Double-Blind Study

9. Cannabis-based medicine (CBM) found more effective than placebo for reducing MS spasticity

PRO

Christine Collin, MD, Senior Consultant in Neuro-rehabilitation at the Royal Berkshire and Battle Hospitals, et al., wrote the following in their article "Randomized Controlled Trial of Cannabis-Based Medicine in Spasticity Caused by Multiple Sclerosis," published in the Mar. 2007 *European Journal of Neurology*:

"Symptoms relating to spasticity are common in multiple sclerosis (MS) and can be difficult to treat. We have investigated the efficacy, safety and tolerability of a standardized ... cannabis-based medicine (CBM) containing delta-9 tetrahydrocannabinol (THC) and cannabidiol (CBD), upon spasticity in MS. A total of 189 subjects with definite MS and spasticity were randomized to receive daily doses of active preparation (n = 124) or placebo (n = 65) in a double blind study over 6 weeks...

The primary efficacy analysis... showed the active preparation to be significantly superior...
We conclude that this CBM [cannabis-based medicine] may represent a useful new agent for treatment of the symptomatic relief of spasticity in MS."

Mar. 2007 - Christine Collin, MD ☆☆☆☆

Double-Blind Study

10. Cannabinoids found to slightly improve spasticity in MS patients, who felt the drugs were helpful

NC

John P. Zajicek, PhD, Professor of Clinical Neuroscience at the Neurology Research and Clinical Trials Unit of the Peninsula Medical School at the University of Plymouth, et al., wrote the following in a Dec. 2005 article titled "Cannabinoids in Multiple Sclerosis (CAMS) Study: Safety and Efficacy Data for 12 Months Follow Up" in the *Journal of Neurology, Neurosurgery and Psychiatry*:

"OBJECTIVE: To test the effectiveness and long term safety of cannabinoids in multiple sclerosis (MS), in a follow up to the main Cannabinoids in Multiple Sclerosis (CAMS) study...

RESULTS: Intention to treat analysis of data from the 80% of patients followed up for 12 months showed evidence of a small treatment effect on muscle spasticity as measured by change in Ashworth score from baseline to 12 months... There was suggestive evidence for treatment effects of Delta(9)-THC on some aspects of disability. There were no major safety concerns. Overall, patients felt that these drugs were helpful in treating their disease...

CONCLUSIONS: These data provide limited evidence for a longer term treatment effect of cannabinoids. A long term placebo controlled study is now needed to establish whether cannabinoids may have a role beyond symptom amelioration in MS."

Dec. 2005 - John P. Zajicek, PhD ☆☆☆

Double-Blind Study

11. Sativex significantly improved spasticity caused by MS

PRO

Derick T. Wade, MD, Professor in the Department of Clinical Neurology at the University of Oxford, et al., wrote the following in an Aug. 2004 article titled "Do Cannabis-based Medicinal Extracts Have General Or Specific Effects on Symptoms in Multiple Sclerosis? A Double-blind, Randomized, Placebo-controlled Study on 160 Patients," published in the journal *Multiple Sclerosis*:

"The primary outcome measure was a Visual Analogue Scale (VAS) score for each patient's most troublesome symptom. Additional measures included VAS scores of other symptoms, and measures of disability, cognition, mood, sleep and fatigue. Following CBME [cannabis-based medicinal extract] the primary symptom score reduced from mean (SE) 74.36 (11.1) to 48.89 (22.0) following CBME and from 74.31 (12.5) to 54.79 (26.3) following placebo [ns].

Spasticity VAS scores were significantly reduced by CBME (Sativex) in comparison with placebo (P=0.001). There were no significant adverse effects on cognition or mood and intoxication was generally mild."

Aug. 2004 - Derick T. Wade, MD ☆☆☆☆

Double-Blind Study

12. Orally administered cannabis reduced spasms and improved mobility in patients with MS

PRO

Claude Vaney, MD, Medical Director of the Neurological Rehabilitation and MS Centre, Montana, Switzerland, et al., wrote in an Aug. 2004 article titled "Efficacy of Tetrahydrocannabinol in Patients Refractory to Standard Antiemetic Therapy. Efficacy, Safety and Tolerability of an Orally Administered Cannabis Extract in the Treatment of Spasticity in Patients with Multiple Sclerosis: A Randomized, Double-blind, Placebo-controlled, Crossover Study" in the journal *Multiple Sclerosis*:

"In the 50 patients included into the intention-to-treat analysis set, there were no statistically significant

differences associated with active treatment compared to placebo, but trends in favour of active treatment were seen for spasm frequency, mobility and getting to sleep.

In the 37 patients (per-protocol set) who received at least 90% of their prescribed dose, improvements in spasm frequency (P = 0.013) and mobility after excluding a patient who fell and stopped walking were seen (P = 0.01). Minor adverse events were slightly more frequent and severe during active treatment, and toxicity symptoms, which were generally mild, were more pronounced in the active phase.

CONCLUSION: A standardized Cannabis sativa plant extract might lower spasm frequency and increase mobility with tolerable side effects in MS patients with persistent spasticity not responding to other drugs."

Aug. 2004 - Claude Vaney, MD ☆☆☆☆☆

Double-Blind Study

13. Cannabis-based medicine extracts helps MS patients with lower urinary tract symptoms

PRO

Ciaran M. Brady, Specialist Registrar in Urology at Edith Cavell Hospital, et al., wrote the following in an Aug. 2004 article titled "An Open-Label Pilot Study of Cannabis-based Extracts for Bladder Dysfunction in Advanced Multiple Sclerosis," published in the journal *Multiple Sclerosis*:

"The majority of patients with multiple sclerosis (MS) develop troublesome lower urinary tract symptoms (LUTS). Anecdotal reports suggest that cannabis may alleviate LUTS, and cannabinoid receptors in the bladder and nervous system are potential pharmacological targets. In an open trial we evaluated the safety, tolerability, dose range, and efficacy of two whole-plant extracts of Cannabis sativa in patients with advanced MS and refractory LUTS.

Urinary urgency, the number and volume of incontinence episodes, frequency and nocturia all decreased significantly following treatment (P <0.05, Wilcoxon's signed rank test). However, daily total voided, catheterized and urinary incontinence pad weights also decreased significantly on both extracts. Patient self-assessment of pain, spasticity and quality of sleep improved significantly (P <0.05, Wilcoxon's signed rank test) with pain improvement continuing up to median of 35 weeks.

There were few troublesome side effects, suggesting that cannabis-based medicinal extracts are a safe and effective treatment for urinary and other problems in patients with advanced MS."

Aug. 2004 - Ciaran M. Brady ☆

14. Cannabis extract did not significantly improve tremor in patients with MS

NC

Patrick Fox, MD, Clinical Neurologist at the Peninsula Medical School at the University of Plymouth, et al., wrote in an Apr. 2004 article titled "The Effect of Cannabis on Tremor in Patients with Multiple Sclerosis" in the journal *Neurology*:

"BACKGROUND: Disabling tremor is common in patients with multiple sclerosis (MS). Data from animal model experiments and subjective and small objective studies involving patients suggest that cannabis may be an effective treatment for tremor associated with MS. To our knowledge, there are no published double-blind randomized controlled trials of cannabis as a treatment for tremor in MS patients...

RESULTS: Analysis of the data showed no significant improvement in any of the objective measures of upper limb tremor with cannabis extract compared to placebo. Finger tapping was faster on placebo compared to cannabis extract (p < 0.02). However, there was a nonsignificant trend for patients to experience more subjective relief from their tremors while on cannabis extract compared to placebo.

CONCLUSIONS: Cannabis extract does not produce a functionally significant improvement in MS-associated tremor."

Apr. 2004 - Patrick Fox, MD ☆☆☆☆☆

Double-Blind Study

15. Cannabinoids did not help with MS spasticity but did improve mobility and self-assessment of pain

NC

John P. Zajicek, PhD, Professor of Clinical Neuroscience at the Neurology Research and Clinical Trials Unit of the Peninsula Medical School at the University of Plymouth, et al., wrote the following in a Nov. 2003 article titled "Cannabinoids for Treatment of Spasticity and Other Symptoms Related to Multiple Sclerosis (CAMS study): Multicentre Randomised Placebo-controlled Trial" in the journal *Lancet* [Note: Patients were given oral cannabis extract, delta-9-THC, or placebo]:

"Background: Multiple sclerosis is associated with muscle stiffness, spasms, pain, and tremor. Much anecdotal evidence suggests that cannabinoids could help these symptoms. Our aim was to test the notion that cannabinoids have a beneficial effect on spasticity and other symptoms related to multiple sclerosis...

Interpretation: Treatment with cannabinoids did not have a beneficial effect on spasticity when assessed with the Ashworth scale. However, though there was a degree of unmasking among the patients in the active treatment groups, objective improvement in mobility and patients' opinion of an improvement in pain suggest cannabinoids might be clinically useful."

Nov. 2003 - John P. Zajicek, PhD ☆☆☆

16. THC and cannabis sativa plant extract did not reduce spasticity in MS patients and worsened global impression

CON

Joep Killestein, MD, PhD, Multiple Sclerosis Researcher in the Department of Neurology at the MS Centre at VU Medical Centre in Amsterdam, et al., wrote in a May 2002 article titled "Safety, Tolerability, and Efficacy of Orally Administered Cannabinoids in MS" in the journal *Neurology*:

> "The authors conducted a randomized, double-blind, placebo-controlled, twofold crossover study in 16 patients with MS who presented with severe spasticity to investigate safety, tolerability, and efficacy of oral Delta(9)-Tetrahydrocannabinol (THC) and Cannabis sativa plant extract. Both drugs were safe, but adverse events were more common with plant-extract treatment. Compared with placebo, neither THC nor plant-extract treatment reduced spasticity. Both THC and plant-extract treatment worsened the participant's global impression."
>
> May 2002 - Joep Killestein, MD, PhD ☆☆☆☆

Double-Blind Study

17. Cannabis extracts quickly relieves spasms and pain in MS patients

PRO

Brian A. Whittle, PhD, co-founder of GW Pharmaceuticals, Geoffrey W. Guy, BSc, co-founder and chairman of GW Pharmaceuticals, Philip Robson, MB, Director of the Cannabinoid Research Institute at GW Pharmaceuticals stated the following in their 2001 study titled "Prospects for New Cannabis-Based Prescription Medicines," published in *Journal of Cannabis Therapeutics*:

> "In practice it has been found that extracts of cannabis [processed whole plant compounds] provide greater relief of pain than the equivalent amount of cannabinoid given as a single chemical entity [such as Marinol]....
>
> Some patients with multiple sclerosis who smoke cannabis [marijuana] report relief of spasm and pain after the second or third puff of a cannabis cigarette. This implies very rapid transit to, and absorption into the central nervous system. The time involved is seconds rather than minutes."
>
> 2001 - Brian A. Whittle, PhD Geoffrey W. Guy, BSC Philip Robson, MB

18. MS patients report improvement in symptoms after cannabis use

PRO

Paul F. Consroe, PhD, Professor Emeritus in the Department of Pharmacology and Toxicology at the University of Arizona, et al., wrote in their Dec. 20, 1997 article titled "The Perceived Effects of Smoked Cannabis on Patients with Multiple Sclerosis" in the journal *European Neurology*:

> "Fifty-three UK and 59 USA people with multiple sclerosis (MS) answered anonymously the first questionnaire on cannabis use and MS. From 97 to 30% of the subjects reported cannabis improved (in descending rank order): spasticity, chronic pain of extremities, acute paroxysmal phenomenon, tremor, emotional dysfunction, anorexia/weight loss, fatigue states, double vision, sexual dysfunction, bowel and bladder dysfunctions, vision dimness, dysfunctions of walking and balance, and memory loss.
>
> The MS subjects surveyed have specific therapeutic reasons for smoking cannabis. The survey findings will aid in the design of a clinical trial of cannabis or cannabinoid administration to MS patients or to other patients with similar signs or symptoms."
>
> Dec. 20, 1997 - Paul F. Consroe, PhD ☆☆☆

19. Smoked marijuana impaired posture and balance in patients with spastic MS

CON

Harry S. Greenberg, MD, Professor in the Department of Neurology at the University of Michigan, et al., wrote the following in their Mar. 1994 article titled "Short-term Effects of Smoking Marijuana on Balance in Patients with Multiple Sclerosis and Normal Volunteers," published in the journal *Clinical Pharmacology and Therapeutics*:

> "A double-blind randomised placebo-controlled study of inhaled marijuana smoke on postural responses was performed in 10 adult patients with spastic multiple sclerosis (MS) and 10 normal volunteers matched as closely as possible for age, sex, and weight. A computer-controlled dynamic posturographic platform with a video line scan camera measured shoulder displacement in response to pseudorandom platform movements.
>
> Pre-marijuana smoking patient tracking was inferior to that of the normal volunteers as indicated by the higher noise variance of the former.
>
> Smoking one marijuana cigarette containing 1.54% Delta-9-tetrahydrocannabinol increased postural tracking error in both the patients and normal control subjects with both eyes open and closed; this untoward effect was greatest for the patients. The tracking error was also accompanied by a decrease in response speed for the patients with their eyes closed.
>
> Marijuana smoking further impairs posture and balance in patients with spastic MS."
>
> Mar. 1994 - Harry S. Greenberg, MD ☆☆☆☆

Double-Blind Study

Return to Top

Nausea

1. Smoked marijuana reduces feelings of nausea

PRO

Anna H. Soderpalm, PhD, Post-doctoral Fellow in the Department of Psychiatry at the University of Chicago, et al., wrote in a July 2001 article titled "Antiemetic Efficacy of Smoked Marijuana: Subjective and Behavioral Effects on Nausea Induced by Syrup of Ipecac" in the journal *Pharmacology, Biochemistry and Behavior*:

> "Although the public debate about the legalization of marijuana has continued for as long as 25 years, few controlled studies have been conducted to assess its potential medical benefits. The present study examined the antiemetic effect of smoked marijuana cigarettes (8.4 and 16.9 mg Delta(9)-tetrahydrocannabinol [THC]) compared to a highly potent antiemetic drug, ondansetron (8 mg) in 13 healthy volunteers. Nausea and emesis were induced by syrup of ipecac. Marijuana significantly reduced ratings of 'queasiness' and slightly reduced the incidence of vomiting compared to placebo. Ondansetron completely eliminated the emetic effects of ipecac. These findings support and extend previous results, indicating that smoked marijuana reduces feelings of nausea and also reduces emesis in this model. However, its effects are very modest relative to ondansetron, and the psychoactive effects of marijuana are likely to limit its clinical usefulness in the general population."
>
> July 2001 - Anna H. Soderpalm, PhD ☆☆☆

Return to Top

Pain

1. Patients reported 64% average decrease in chronic pain after using cannabis

PRO

Charles W. Webb, MD, an urgent care physician, and Sandra M. Webb, RN, an emergency and radiology nurse, stated the following in their Apr. 2014 study titled "Therapeutic Benefits of Cannabis: A Patient Survey," published in *Hawaii Journal of Medicine and Public Health*:

> "Between July of 2010 and February of 2011, we hand-delivered questionnaires to one hundred consecutive patients who had been certified for the medical use of cannabis for a minimum of one year and were currently re-applying for certification...
>
> **Results**
> [...] Average reported pain relief from medical cannabis was substantial. Average pre-treatment pain on a zero to ten scale was 7.8, whereas average post-treatment pain was 2.8, giving a reported average improvement of 5 points. This translates to a 64% average relative decrease in pain...
>
> **Conclusions**
> Cannabis is an extremely safe and effective medication for many patients with chronic pain. In stark contrast to opioids and other available pain medications, cannabis is relatively non-addicting and has the best safety record of any known pain medication (no deaths attributed to overdose or direct effects of medication). Adverse reactions are mild and can be avoided by titration of dosage using smokeless vaporizers."
>
> Apr. 2014 - Charles W. Webb, MD and Sandra M. Webb, RN

2. Low and medium doses of vaporized cannabis reduced neuropathic pain

PRO

Barth Wilsey, MD, Director of the University of California at Davis Analgesic Research Center, et al., stated the following in their Feb. 2013 study titled "Low Dose Vaporized Cannabis Significantly Improves Neuropathic Pain," published in the *Journal of Pain*:

> "We conducted a double-blind, placebo-controlled, crossover study evaluating the analgesic efficacy of vaporized cannabis in subjects, the majority of whom were experiencing neuropathic pain despite traditional treatment. Thirty-nine patients with central and peripheral neuropathic pain underwent a standardized procedure for inhaling either medium dose (3.53%), low dose (1.29%), or placebo cannabis...
>
> Mixed effects regression models demonstrated an analgesic response to vaporized cannabis. There was no significant difference between the two active dose groups' results ($p>0.7$)... [C]annabis has analgesic efficacy with the low dose being, for all intents and purposes, as effective a pain reliever as the medium dose. Psychoactive effects were minimal and well-tolerated, and neuropsychological effects were of limited duration and readily reversible within 1–2 hours. Vaporized cannabis, even at low doses, may present an effective option for patients with treatment-resistant neuropathic pain."
>
> Feb. 2013 -Barth Wilsey, MD ☆☆☆☆

Double-Blind Study

3. Smoked cannabis three times a day reduced neuropathic pain and improved sleep

PRO

Mark A. Ware, MD, MSc, et al., stated the following in their Aug. 30, 2010 study titled "Smoked Cannabis for Chronic Neuropathic Pain: A Randomized Controlled Trial," published in the *Canadian Medical Association Journal*:

> "Adults with post-traumatic or postsurgical neuropathic pain were randomly assigned to receive cannabis at four potencies (0%, 2.5%, 6% and 9.4% tetrahydrocannabinol) over four 14-day periods in a crossover trial. Participants inhaled a single 25-mg dose through a pipe three times daily for the first five days in each cycle, followed by a nine-day washout period. Daily average pain intensity was measured using an 11-point numeric rating scale.
>
> **Conclusion**
>
> A single inhalation of 25 mg of 9.4% tetrahydrocannabinol herbal cannabis three times daily for five days reduced

the intensity of pain, improved sleep and was well tolerated."
Aug. 30, 2010 - Mark A. Ware, MD, MSc ☆☆☆☆

Double-Blind Study

4. Low and high doses of smoked cannabis relieved neuropathic pain of diverse causes

PRO

Barth Wilsey, MD, Director of the University of California at Davis Analgesic Research Center, et al., stated the following in his June 2008 study titled "A Randomized, Placebo Controlled Cross-Over Trial of Cannabis Cigarettes in Neuropathic Pain," published in the *Journal of Pain*:

> "This study's objective was to examine the efficacy of two doses of smoked cannabis on pain in persons with neuropathic pain of different origins (e.g., physical trauma to nerve bundles, spinal cord injury, multiple sclerosis, diabetes). In a double-blind, randomized clinical trial participants received either lowdose, high-dose, or placebo cannabis cigarettes...
>
> Thirty-eight patients underwent a standardized procedure for smoking either high-dose (7%), low-dose (3.5%), or placebo cannabis; of these, 32 completed all three smoking sessions. The study demonstrated an analgesic response to smoking cannabis with no significant difference between the low and the high dose cigarettes. The study concluded that both low and high cannabis doses were efficacious in reducing neuropathic pain of diverse causes."
> June 2008 - Barth Wilsey, MD ☆☆☆☆

Double-Blind Study

5. Marijuana found to both reduce and increase capsaicin-induced pain (injection of chili pepper ingredient) depending on dose

NC

Mark Wallace, MD, Professor of Anesthesiology at the University of California at San Diego, et al., stated the following in their Nov. 2007 article titled "Dose-Dependent Effects of Smoked Cannabis on Capsaicin-Induced Pain and Hyperalgesia in Healthy Volunteers," published in the journal *Anesthesiology*:

> "In summary, in this model of human experimental pain, smoked cannabis was demonstrated to have a delayed biphasic [two phase] effect on pain scores induced by intradermal capsaicin [chili pepper heat injected into the skin]. The low dose [of marijuana] had no effect, the medium dose significantly reduced the pain and the high dose significantly increased the pain... No conclusions on the analgesic efficacy of smoked cannabis on clinical pain states can be made from this study as the relationship between analgesic effects in experimental pain and clinical pain states is unknown."
> Nov. 2007 - Mark Wallace, MD ☆☆☆☆

Double-Blind Study

6. Cannabis-based medicines produced significant improvements in pain severity and sleep in patients with brachial plexus root avulsion

PRO

Jonathan S. Berman, MA, Consulting Anaesthetist at the Royal National Orthopaedic Hospital, et al., wrote the following in a Dec. 2004 article titled "Efficacy of Two Cannabis Based Medicinal Extracts for Relief of Central Neuropathic Pain from Brachial Plexus Avulsion: Results of a Randomised Controlled Trial" in the journal *Pain*:

> "The objective was to investigate the effectiveness of cannabis-based medicines for treatment of chronic pain associated with brachial plexus root avulsion. This condition is an excellent human model of central neuropathic pain as it represents an unusually homogenous group in terms of anatomical location of injury, pain descriptions and patient demographics...
>
> The primary outcome measure was the mean pain severity score during the last 7 days of treatment. Secondary outcome measures included pain related quality of life assessments. The primary outcome measure failed to fall by the two points defined in our hypothesis. However, both this measure and measures of sleep showed statistically significant improvements.
>
> The study medications were generally well tolerated with the majority of adverse events, including intoxication type reactions, being mild to moderate in severity and resolving spontaneously. Studies of longer duration in neuropathic pain are required to confirm a clinically relevant, improvement in the treatment of this condition."
> Dec. 2004 - Jonathan S. Berman, MA ☆

Double-Blind Study

7. Patients report improvement in pain, sleep, and mood after cannabis use

PRO

Mark A. Ware, MSc, Director of Research at the Magill University Health Centre (MUHC) Pain Clinic in Canada, et al., wrote the following in a Mar. 2003 article titled "Cannabis Use for Chronic Non-Cancer Pain: Results of a Prospective Survey" in the journal *Pain*:

> "There has been a surge in interest in medicinal cannabis in Canada. We conducted a questionnaire survey to determine the current prevalence of medicinal cannabis use among patients with chronic non-cancer pain, to estimate the dose size and frequency of cannabis use, and to describe the main symptoms for which relief was being sought...
>
> Of the 32 subjects who used cannabis for pain, 17 (53%) used four puffs or less at each dosing interval, eight

(25%) smoked a whole cannabis cigarette (joint) and four (12%) smoked more than one joint. Seven (22%) of these subjects used cannabis more than once daily, five (16%) used it daily, eight (25%) used it weekly and nine (28%) used it rarely. Pain, sleep and mood were most frequently reported as improving with cannabis use, and 'high' and dry mouth were the most commonly reported side effects. We conclude that cannabis use is prevalent among the chronic non-cancer pain population, for a wide range of symptoms, with considerable variability in the amounts used."

Mar. 2003 - Mark A. Ware, MSc ☆

Return to Top

Parkinson's Disease

1. Smoked cannabis produced improvements in patients' Parkinson's symptoms with no significant adverse effects

PRO

Itay Lotan, MD, physician in the Neurology department at Rabin Medical Center in Israel, et al., stated the following in their Mar./Apr. 2014 study titled "Cannabis (Medical Marijuana) Treatment for Motor and Non–Motor Symptoms of Parkinson Disease: An Open-Label Observational Study," published in *Clinical Neuropharmacology*:

"Methods: Twenty-two patients with PD [Parkinson's disease] attending the motor disorder clinic of a tertiary medical center in 2011 to 2012 were evaluated at baseline and 30 minutes after smoking cannabis using the following battery: Unified Parkinson Disease Rating Scale, visual analog scale, present pain intensity scale, Short-Form McGill Pain Questionnaire, as well as Medical Cannabis Survey National Drug and Alcohol Research Center Questionnaire.

Results: Mean (SD) total score on the motor Unified Parkinson Disease Rating Scale score improved significantly from 33.1 (13.8) at baseline to 23.2 (10.5) after cannabis consumption ($t = 5.9$; $P < 0.001$). Analysis of specific motor symptoms revealed significant improvement after treatment in tremor ($P < 0.001$), rigidity ($P = 0.004$), and bradykinesia ($P < 0.001$).

Conclusions: There was also significant improvement of sleep and pain scores. No significant adverse effects of the drug were observed. The study suggests that cannabis might have a place in the therapeutic armamentarium of PD. Larger, controlled studies are needed to verify the results."

Mar./Apr. 2014 - Itay Lotan, MD

2. Orally administered cannabis produced no improvement in dyskinesias or parkinsonism

NC

Camille B. Carroll, PhD, Clinical Research Fellow at the Peninsula College of Medicine and Dentistry, et al., wrote in an Oct. 2004 article titled "Cannabis For Dyskinesia In Parkinson Disease: A Randomized Double-blind Crossover Study" in the journal *Neurology*:

"Seventeen patients completed the RCT. Cannabis was well tolerated, and had no pro- or antiparkinsonian action. There was no evidence for a treatment effect on levodopa-induced dyskinesia as assessed by the UPDRS, or any of the secondary outcome measures.

CONCLUSIONS: Orally administered cannabis extract resulted in no objective or subjective improvement in dyskinesias or parkinsonism."

Oct. 2004 - Camille B. Carroll, PhD ☆☆☆

Double-Blind Study

3. Patients with Parkinson's report improvement two months after starting cannabis use

PRO

Katerina Venderová, PhD, Assistant Professor at University of the Pacific and former researcher at the Movement Disorders Centre in the Department of Neurology at Charles University in Prague, Czech Republic, et al.,wrote in their Sep. 2004 article "Survey on Cannabis Use In Parkinson's Disease," published in the journal *Movement Disorders*:

"An anonymous questionnaire sent to all patients attending the Prague Movement Disorder Centre revealed that 25% of 339 respondents had taken cannabis and 45.9% of these described some form of benefit....

The late onset of cannabis action is noteworthy. Because most patients reported that improvement occurred approximately two months after the first use of cannabis, it is very unlikely that it could be attributed to a placebo reaction."

Sep. 2004 - Katerina Venderová, PhD

Return to Top

Post-Traumatic Stress Disorder (PTSD)

1. PTSD symptoms were reduced by more than 75% in patients using cannabis

PRO

George R. Greer, MD, a physician in Santa Fe, NM, Charles S. Grob, MD, Director of Division of Child and Adolescent Psychiatry at Harbor-UCLA Medical Center, and Adam L. Halberstadt, PhD, Assistant Research Scientist in the Department of

Psychiatry at the University of California San Diego, stated the following in their Mar. 2014 article titled "PTSD Symptom Reports of Patients Evaluated for the New Mexico Medical Cannabis Program," published in the *Journal of Psychoactive Drugs*:

> "Background: New Mexico was the first state to list post-traumatic stress disorder (PTSD) as a condition for the use of medical cannabis. There are no published studies, other than case reports, of the effects of cannabis on PTSD symptoms. The purpose of the study was to report and statistically analyze psychometric data on PTSD symptoms collected during 80 psychiatric evaluations of patients applying to the New Mexico Medical Cannabis Program from 2009 to 2011.
>
> Methods: The Clinician Administered Posttraumatic Scale for DSM-IV (CAPS) was administered retrospectively and symptom scores were then collected and compared in a retrospective chart review of the first 80 patients evaluated.
>
> Results: Greater than 75% reduction in CAPS symptom scores were reported when patients were using cannabis compared to when they were not.
>
> Conclusions: Cannabis is associated with reductions in PTSD symptoms in some patients, and prospective, placebo-controlled study is needed to determine efficacy of cannabis and its constituents in treating PTSD."

Mar. 2014 - George R. Greer, MD, Charles S. Grob, MD, and Adam L. Halberstadt, PhD

Return to Top

Psychosis / Schizophrenia

1. Cannabis use had no compounding effects on cognition or emotion/affect-based decision-making in schizophrenia patients

NC

Serge Sevy, MD, MBA, Adjunct Associate Professor of Clinical Psychiatry and Behavioral Sciences at the Albert Einstein College of Medicine, et al., wrote in their Jan. 11, 2007 article "Iowa Gambling Task in Schizophrenia: A Review and New Data in Patients with Schizophrenia and Co-occurring Cannabis Use Disorders" in *Schizophrenia Research*:

> "We reviewed previous studies comparing schizophrenia patients and healthy subjects for performance on the Iowa Gambling Task (IGT) (a laboratory task designed to measure emotion-based decision-making), and found mixed results. We hypothesize that deficits in IGT performance in schizophrenia may be more specifically related to concurrent substance use disorders. To test this hypothesis, we compared schizophrenia patients with (SCZ(+)) or without (SCZ(-)) cannabis use disorders, to healthy subjects, on measures of cognition and IGT performance...
>
> There were no differences between SCZ(+) and SCZ(-) patients on most of the cognitive tests, and IGT performance... Schizophrenia patients show widespread impairments in several cognitive domains and emotion-based decision-making... More intriguing, it appears that the concurrent abuse of cannabis has no compounding effects on cognition, as well as emotion/affect-based decision-making."

Jan. 11, 2007 - Serge Sevy, MD, MBA ☆☆☆☆

2. Among patients with schizophrenia, cannabis users had better cognitive functioning

PRO

John Stirling, DPhil, Principal Lecturer/Reader in the Research Institute for Health and Social Change at Manchester Metropolitan University, et al., wrote in their Oct. 21, 2004 article "Cannabis Use Prior to First Onset Psychosis Predicts Spared Neurocognition at 10-year Follow-up" in *Schizophrenia Research*:

> "A priori cannabis use was recorded at index admission for 112 participants in the Manchester first-episode psychosis cohort. 69 of the 100 surviving (mainly schizophrenia) patients were followed up 10–12 years later and assessed on a battery of clinical, behavioural and neurocognitive measures. Individuals who had not used cannabis before the first episode of illness were generally indistinguishable from cannabis users at follow-up, except that the latter group evidenced a marked 'sparing' of neurocognitive functions...
>
> [C]annabis users had better cognitive functioning than patients without cannabis use in several domains including design memory, verbal fluency, object assembly, block design, picture completion, picture arrangement, and face recognition memory."

Oct. 21, 2004 - John Stirling, DPhil ☆☆☆

Return to Top

Rheumatoid Arthritis

1. Sativex improved pain while moving and at rest in patients with rheumatoid arthritis

PRO

David Blake, PhD, Professor of Bone and Joint Medicine at the Royal National Hospital for Rheumatic Diseases, et al., stated the following in their Jan. 2006 study titled "Preliminary Assessment of the Efficacy, Tolerability and Safety of a Cannabis-Based Medicine (Sativex) in the Treatment of Pain Caused by Rheumatoid Arthritis," published in *Rheumatology* journal:

"*Objectives.* To assess the efficacy of a cannabis-based medicine (CBM) in the treatment of pain due to rheumatoid arthritis (RA).

Methods. We compared a CBM (Sativex) with placebo in a randomized, double-blind, parallel group study in 58 patients over 5 weeks of treatment...

Results. [...] In comparison with placebo, the CBM produced statistically significant improvements in pain on movement, pain at rest, quality of sleep...

Conclusions. In the first ever controlled trial of a CBM in RA, a significant analgesic effect was observed and disease activity was significantly suppressed following Sativex treatment. Whilst the differences are small and variable across the population, they represent benefits of clinical relevance and show the need for more detailed investigation in this indication."
Jan. 2006 - David Blake, PhD

Double-Blind Study

Return to Top

Tourette's Syndrome

1. THC was "effective and safe in the treatment of tics" from Tourette syndrome

PRO

Kirsten Müller-Vahl, MD, Director of Tourette Syndrome Clinic at the Medical School of Hannover, et al., stated the following in their Apr. 2003 study titled "Delta 9-Tetrahydrocannabinol (THC) Is Effective in the Treatment of Tics in Tourette Syndrome: A 6-Week Randomized Trial," published in the *Journal of Clinical Psychiatry*:

"**METHOD:** In this randomized, double-blind, placebo-controlled study, 24 patients with TS [Tourette syndrome], according to DSM-III-R criteria, were treated over a 6-week period with up to 10 mg/day of THC...

RESULTS: Seven patients dropped out of the study or had to be excluded, but only 1 due to side effects. Using the TS-CGI, STSSS, YGTSS, and video rating scale, we found a significant difference ($p < .05$) or a trend toward a significant difference ($p < .10$) between THC and placebo groups at visits 2, 3, and/or 4. Using the TSSL at 10 treatment days (between days 16 and 41) there was a significant difference ($p < .05$) between both groups. ANOVA as well demonstrated a significant difference ($p = .037$). No serious adverse effects occurred.

CONCLUSION: Our results provide more evidence that THC is effective and safe in the treatment of tics. It, therefore, can be hypothesized that the central cannabinoid receptor system might play a role in TS pathology."
Apr. 2003 - Kirsten Müller-Vahl, MD ☆☆☆☆

Double-Blind Study

2. Anecdotal reports suggest beneficial effects of marijuana for Tourette's syndrome

PRO

Kirsten Müller-Vahl, MD, Director of Tourette Syndrome Clinic at the Medical School of Hannover, et al., stated the following in their Dec. 1998 study titled "Cannabinoids: Possible Role in Patho-physiology and Therapy of Gilles De La Tourette Syndrome," published in the journal *Acta Psychiatrica Scandinavica*:

"High densities of cannabinoid receptors were found in the basal ganglia and hippocampus, indicating a putative functional role of cannabinoids in movement and behaviour. Anecdotal reports suggested beneficial effects of marijuana in Tourette's syndrome (TS).

We therefore interviewed 64 TS patients with regard to use of marijuana and its influence on TS symptomatology. Of 17 patients (27%) who reported prior use of marijuana, 14 subjects (82%) experienced a reduction or complete remission of motor and vocal tics and an amelioration of premonitory urges and obsessive-compulsive symptoms.

Our results provide more evidence that marijuana improves tics and behavioural disorders in TS. It can be speculated that cannabinoids might act through specific receptors, and that the cannabinoid system might play a major role in TS pathology."
Dec. 1998 - Kirsten Müller-Vahl, MD ☆☆☆☆

Return to Top

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