

Studies and Case Reports

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- Improvement of symptoms or positive evaluation by authors
- No relevant change of symptoms or negative evaluation by authors
- ❖ Deterioration of symptoms

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Nausea and Vomiting – Cancer Chemotherapy

Controlled Studies

Dronabinol

- Artim R, DiBella N. Tetrahydrocannabinol (THC) plus prochlorperazine (PCZ) for refractory nausea and vomiting (N/V). Proceedings of the American Society for Clinical Oncology 1983;2:84.
- Chang AE, Shiling DJ, Stillman RC, Goldberg NH, Seipp CA, Barofsky I. Delta-9-tetrahydrocannabinol as an antiemetic in cancer patients receiving high-dose methotrexate. Annals of Internal Medicine 1979;91:819-824.
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- Gralla RJ, Tyson LB, Bordin LA, Clark RA, Kelsen DP, Kris MG. Antiemetic therapy: a review of recent studies and a report of a random assignment trial comparing metoclopramide with delta-9-tetrahydrocannabinol. Cancer Treatment Report 1984;68:163-172.
- Kluin-Nelemans JC, Nelemans FA, Meuwissen OJ, Th, Maes RAA. Δ^9 -tetrahydrocannabinol (THC) as an antiemetic in patients treated with cancer chemotherapy; a double-blind cross-over trial against placebo. Veterinary and Human Toxicology 1979;21:338-340.
- Lane M, Vogel CL, Ferguson J, Krasnow S, Saiers JL, Hamm J. Dronabinol and prochlorperazine in combination for treatment of cancer chemotherapy-induced nausea and vomiting. Journal of Pain and Symptom Management 1991;6:352-359.
- Levitt M, Faiman C, Hawks R, Wilson A. Randomized double blind comparison of delta-9-tetrahydrocannabinol (THC) and marijuana as chemotherapy antiemetics. Proceedings of the American Society for Clinical Oncology 1984;3:91.
- Levitt M, Wilson A, Bowman D, Faiman C, Kemel S, Krepart G. Dose vs response of tetrahydrocannabinol (THC) vs prochlorperazine as chemotherapy antiemetics. Proceedings of the American Society for Clinical Oncology 1981;22:422.
- McCabe M, Smith FP, Goldberg D, Macdonald J, Woolley PV, Warren R. Efficacy of tetrahydrocannabinol in patients refractory to standard anti-emetic therapy. Investigational New Drugs 1988;6:243-246.
- Neidhart JA, Gagen MM, Wilson HE, Young DC. Comparative trial of the antiemetic effects of THC and haloperidol. International Journal of Clinical Pharmacology Research 1981; 21: 38-42S.
- Orr LE, McKernan JF, Bloome B. Antiemetic effect of tetrahydrocannabinol. Compared with placebo and prochlorperazine in chemotherapy-associated nausea and emesis. Archives of Internal Medicine 1980;140:1431-433.
- Sallan SE, Cronin C, Zelen M, Zinberg NE. Antiemetics in patients receiving chemotherapy for cancer. A randomized comparison of delta-9-tetrahydrocannabinol and prochlorperazine. New England Journal of Medicine 1980;302:135-138.
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- Ungerleider JT, Andrysiak T, Fairbanks L, Goodnight J, Sarna G, Jamison K. Cannabis and cancer chemotherapy. A comparison of oral delta-9-THC and prochlorperazine. Cancer 1982;50:636-645.
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- Meiri E, Jhangiani H, Vredenburg JJ, Barbato LM, Carter FJ, Yang HM, Baranowski V. Efficacy of dronabinol alone and in combination with ondansetron versus ondansetron alone for delayed chemotherapy-induced nausea and vomiting. *Curr Med Res Opin* 2007;23(3):533-43.

Cannabis (smoked)

- Levitt M, Faiman C, Hawks R, Wilson A. Randomized double blind comparison of delta-9-tetrahydrocannabinol (THC) and marijuana as chemotherapy antiemetics. *Proceedings of the American Society for Clinical Oncology* 1984;3:91.

Cannabis (oral, sublingual)

- Duran M, Pérez E, Abanades S, Vidal X, Saura C, Majem M, Arriola E, Rabanal M, Pastor A, Farré M, Rams N, Laporte JR, Capellà D. Preliminary efficacy and safety of an oromucosal standardized cannabis extract in chemotherapy-induced nausea and vomiting. *Br J Clin Pharmacol* 2010;70(5):656-63.

Nabilone

- Ahmedzai S, Carlyle DL, Clader IT, Moran F. Anti-emetic efficacy and toxicity of nabilone, a synthetic cannabinoid, in lung cancer chemotherapy. *British Journal of Cancer* 1983;48:657-663.
- Chan HS, Correia JA, MacLeod SM. Nabilone versus prochlorperazine for control of cancer chemotherapy-induced emesis in children: a double-blind, crossover trial. *Pediatrics* 1987; 79: 946-952
- Crawford SM, Buckman R. Nabilone and metoclopramide in the treatment of nausea and vomiting due to cisplatin: a double blind study. *Medical Oncology and Tumor Pharmacotherapy* 1986; 3: 39-42.
- Cunningham D, Bradley CJ, Forrest GJ, Hutcheon AW, Adams L, Sneddon M, et al. A randomized trial of oral nabilone and prochlorperazine compared to intravenous metoclopramide and dexamethasone in the treatment of nausea and vomiting induced by chemotherapy regimens containing cisplatin or cisplatin analogues. *European Journal of Cancer and Clinical Oncology* 1988; 24: 685-689.
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- Einhorn LH, Nagy C, Furnas B, Williams SD. Nabilone: an effective antiemetic in patients receiving cancer chemotherapy. *Journal of Clinical Pharmacology*. 1981 Aug-Sep;21(8-9 Suppl):64S-69S.
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- Levitt M. Nabilone vs placebo in the treatment of chemotherapy-induced nausea and vomiting in cancer patients. *Cancer Treatment Reviews* 1982; 9(suppl B): 49-53.
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- Niederle N, Schutte J, Schmidt CG. Crossover comparison of the antiemetic efficacy of nabilone and alizapride in patients with nonseminomatous testicular cancer receiving cisplatin therapy. *Klinische Wochenschrift* 1986; 64: 362-365.
- Niiranen Aila, Mattson K. A cross-over comparison of nabilone and prochlorperazine for emesis induced by cancer chemotherapy. *American Journal of Clinical Oncology* 1985;8:336-340.
- Pomeroy M, Fennelly JJ, Towers M. Prospective randomized double-blind trial of nabilone versus domperidone in the treatment of cytotoxic-induced emesis. *Cancer Chemotherapy and Pharmacology* 1986;17:285-288.

- Priestman SG, Priestman TJ, Canney PA. A double-blind randomised cross-over comparison of nabilone and metoclopramide in the control of radiation-induced nausea. *Clinical Radiology* 1987; 38: 543-544.
- Steele N, Gralla RJ, Braun Jr DW, Young CW. Double-blind comparison of the antiemetic effects of nabilone and prochlorperazine on chemotherapy-induced emesis. *Cancer Treatment Report* 1980; 64: 219-224.
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Levonantradol

- Citron ML, Herman TS, Vreeland F, Krasnow SH, Fossieck BE, Jr. Antiemetic efficacy of levonantradol compared to delta-9-tetrahydrocannabinol for chemotherapy-induced nausea and vomiting. *Cancer Treatment Reports* 1985;69:109-112.
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Uncontrolled Studies

Delta-8-THC

- Abrahamov A, Abrahamov A, Mechoulam R. An efficient new cannabinoid antiemetic in pediatric oncology. *Life Sciences* 1995;56:2097-2102.

Cannabis (smoked)

- Vinciguerra V, Moore T, Brennan E. Inhalation marijuana as an antiemetic for cancer chemotherapy. *New York State Journal of Medicine* 1988;88:525-527.
- Musty RE, Rossi R. Effects of smoked cannabis and oral delta-9-tetrahydrocannabinol on nausea and emesis after cancer chemotherapy: A review of state clinical trials. *J Cannabis Ther* 2001;1(1):29-42.
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Dronabinol

- Hernandez SL, Sheyner I, Stover KT, Stewart JT. Dronabinol Treatment of Refractory Nausea and Vomiting Related to Peritoneal Carcinomatosis. *Am J Hosp Palliat Care.* 2015;32(1):5-7.

Case Reports, Surveys

- Doblin RE, Kleiman MA. Marijuana as antiemetic medicine: a survey of oncologists' experiences and attitudes. *American Journal of Clinical Oncology* 1991; 9: 1314-1319.
- Schwartz RH, Voth EA, Sheridan MJ. Marijuana to prevent nausea and vomiting in cancer patients: a survey of clinical oncologists. *South Medical Journal* 1997;90(2):167-72.

Nausea and Vomiting – Radiotherapy

Controlled Studies

Dronabinol

- Ungerleider JT, Andrysiak TA, Fairbanks LA, Tesler AS, Parker RG. Tetrahydrocannabinol vs. prochlorperazine. The effects of two antiemetics on patients undergoing radiotherapy. *Radiology* 1984;150(2):598-9.

Levonantradol

- Lucraft HH, Palmer MK. Randomised clinical trial of levonantradol and chlorpromazine in the prevention of radiotherapy-induced vomiting. *Clinical Radiology* 1982; 33: 621-622.

Dronabinol

- Côté M, Trudel M, Wang C, Fortin A. Improving Quality of Life With Nabilone During Radiotherapy Treatments for Head and Neck Cancers: A Randomized Double-Blind Placebo-Controlled Trial. *Ann Otol Rhinol Laryngol.* 2016;125(4):317-24.

Nausea and Vomiting – Metastases

Uncontrolled Studies

Dronabinol

- Zutt M, Hanssle H, Emmert S, Neumann C, Kretschmer L. [Dronabinol for supportive therapy in patients with malignant melanoma and liver metastases] [Article in German]. *Hautarzt* 2006;57(5):423-7.

Case Reports, Surveys

Dronabinol

- Gonzalez-Rosales F, Walsh D. Intractable nausea and vomiting due to gastrointestinal mucosal metastases relieved by tetrahydrocannabinol (dronabinol). *Journal of Pain and Symptom Management* 1997;14(5):311-314.

Nausea and Vomiting – Surgery

Controlled Studies

Dronabinol

- Layeeque R, Siegel E, Kass R, Henry-Tillman RS, Colvert M, Mancino A, Klimberg VS. Prevention of nausea and vomiting following breast surgery. *Am J Surg* 2006;191(6):767-72.

Nabilone

- Lewis IH, Campbell DN, Barrowcliffe MP. Effect of nabilone on nausea and vomiting after total abdominal hysterectomy. *British Journal of Anaesthesia* 1994; 73: 244-246.
- Levin DN, Dulberg Z, Chan AW, Hare GM, Mazer CD, Hong A. A randomized-controlled trial of nabilone for the prevention of acute postoperative nausea and vomiting in elective surgery. *Can J Anaesth.* 2017;64(4):385-395.

Nausea and Vomiting – HIV/AIDS

Uncontrolled Studies

Cannabis (smoked)

- de Jong BC, Prentiss D, McFarland W, Machezano R, Israelski DM. Marijuana use and its association with adherence to antiretroviral therapy among HIV-infected persons with moderate to severe nausea. *J Acquir Immune Defic Syndr* 2005;38(1):43-6.

Case Reports, Surveys

Cannabis (smoked)

- Woolridge E, Barton S, Samuel J, Osorio J, Dougherty A, Holdcroft A. Cannabis use in HIV for pain and other medical symptoms. *J Pain Symptom Manage* 2005;29(4):358-67.

- Sidney S. Marijuana use in HIV-positive and AIDS patients: Results of a an anonymous mail survey. *J Cannabis Ther* 2001;1(3-4):35-43.
- Corless IB, Lindgren T, Holzemer W, Robinson L, Moezzi S, Kirksey K, Coleman C, Tsai YF, Sanzero Eller L, Hamilton MJ, Sefcik EF, Canaval GE, Rivero Mendez M, Kemppainen JK, Bunch EH, Nicholas PK, Nokes KM, Dole P, Reynolds N. Marijuana Effectiveness as an HIV Self-Care Strategy. *Clin Nurs Res* 2009;18(2):172-93.

Nausea and Vomiting – Therapy of Hepatitis C

Uncontrolled Studies

Dronabinol, Nabilone

- Costiniuk CT, Mills E, Cooper CL. Evaluation of oral cannabinoid-containing medications for the management of interferon and ribavirin-induced anorexia, nausea and weight loss in patients treated for chronic hepatitis C virus. *Can J Gastroenterol* 2008;22(4):376-80.

Cannabis (smoked)

- Sylvestre DL, Clements BJ, Malibu Y. Cannabis use improves retention and virological outcomes in patients treated for hepatitis C. *Eur J Gastroenterol Hepatol* 2006;18(10):1057-63.

Nausea and Vomiting – Pregnancy

Case Reports, Surveys

Cannabis (smoked)

- Curry W-NL. Hyperemesis gravidarum and clinical cannabis: To eat or not to eat? *J Cannabis Ther* 2002;2(3-4):63-83.
- Westfall RE, Janssen PA, Lucas P, Capler R. Survey of medicinal cannabis use among childbearing women: patterns of its use in pregnancy and retroactive self-assessment of its efficacy against 'morning sickness'. *Complement Ther Clin Pract* 2006;12(1):27-33.

Nausea and Vomiting – Motion Sickness

Uncontrolled Studies

Parabolic Flight (no substance)

- Choukèr A, Kaufmann I, Kreth S, Hauer D, Feuerecker M, Thieme D, Vogeser M, Thiel M, Schelling G. Motion sickness, stress and the endocannabinoid system. *PLoS One* 2010;5(5):e10752.

Nausea and Vomiting – Other

Case Reports, Surveys

Dronabinol

- Merriman AR, Oliak DA. Use of medical marijuana for treatment of severe intractable nausea after laparoscopic Roux-en-Y gastric bypass surgery: case report. *Surg Obes Relat Dis* 2008;4(4):550-1.

Cannabis (oral, sublingual)

- Adhiyaman V, Arshad S. Cannabis for intractable nausea after bilateral cerebellar stroke. *J Am Geriatr Soc.* 2014 Jun;62(6):1199.
- Bleckwenn M, Weckbecker K, Voss S. Beneficial Effect of Medical Cannabis in the Treatment of a Pharmacoresistant Nausea Associated with a Somatoform Disorder in a Patient with Post-Polio Syndrome. *Dtsch Med Wochenschr.* 2018;143(5):344-348.

Nausea and Vomiting – Healthy Subjects

Controlled Studies

Cannabis (smoked)

- Soderpalm AH, Schuster A, de Wit H. Antiemetic efficacy of smoked marijuana: subjective and behavioral effects on nausea induced by syrup of ipecac. *Pharmacology, Biochemistry and Behavior* 2001;69(3-4):343-50.

Appetite Loss – HIV/AIDS

Controlled Studies

Dronabinol

- Beal JE, Olson R, Laubenstein L, Morales JP, Bellman P, Yangco B, Lefkowitz L, Plasse TF, Shepard KV. Dronabinol as a treatment for anorexia associated with weight loss in patients with AIDS. *Journal of Pain and Symptom Management* 1995;10(2):89-97.
- Timpone JG, Wright DJ, Li N, Egorin MJ, Enama ME, Mayers J, Galetto G, and the DATRI 004 Study Group. The safety and pharmacokinetics of single-agent and combination therapy with megestrol acetate and dronabinol for the treatment of HIV wasting syndrome. *AIDS Research and Human Retroviruses* 1997;13:305-315.
- Abrams DI, Hilton JF, Leiser RJ, Shade SB, Elbeik TA, Aweeka FT, Benowitz NL, Bredt BM, Kosel B, Aberg JA, Deeks SG, Mitchell TF, Mulligan K, Bacchetti P, McCune JM, Schambelan M. Short-term effects of cannabinoids in patients with HIV-1 infection: a randomized, placebo-controlled clinical trial. *Ann Intern Med* 2003;139(4):258-66.
- Haney M, Rabkin J, Gunderson E, Foltin RW. Dronabinol and marijuana in HIV(+) marijuana smokers: acute effects on caloric intake and mood. *Psychopharmacology (Berl)* 2005;181(1):170-8.
- Haney M, Gunderson EW, Rabkin J, Hart CL, Vosburg SK, Comer SD, Foltin RW. Dronabinol and marijuana in HIV-positive marijuana smokers. Caloric intake, mood, and sleep. *J Acquir Immune Defic Syndr* 2007;45(5):545-54.
- Bedi G, Foltin RW, Gunderson EW, Rabkin J, Hart CL, Comer SD, Vosburg SK, Haney M. Efficacy and tolerability of high-dose dronabinol maintenance in HIV-positive marijuana smokers: a controlled laboratory study. *Psychopharmacology (Berl)* 2010;212(4):675-86.

Cannabis (smoked)

- Haney M, Rabkin J, Gunderson E, Foltin RW. Dronabinol and marijuana in HIV(+) marijuana smokers: acute effects on caloric intake and mood. *Psychopharmacology (Berl)* 2005;181(1):170-8.
- Haney M, Gunderson EW, Rabkin J, Hart CL, Vosburg SK, Comer SD, Foltin RW. Dronabinol and marijuana in HIV-positive marijuana smokers. Caloric intake, mood, and sleep. *J Acquir Immune Defic Syndr* 2007;45(5):545-54.
- Riggs PK, Vaida F, Rossi SS, Sorkin LS, Gouaux B, Grant I, Ellis RJ. A pilot study of the effects of cannabis on appetite hormones in HIV-infected adult men. *Brain Res.* 2012;1431:46-52.

Uncontrolled Studies

Dronabinol

- Gorter R, Seefried M, Volberding P. Dronabinol effects on weight in patients with HIV infection. *AIDS* 1992;6:127.
- Plasse TF, Gorter RW, Krasnow SH, Lane M, Shepard KV, Wadleigh RG. Recent clinical experience with dronabinol. *Pharmacology, Biochemistry and Behavior* 1991;40:695-700.
- Plasse T, Conant M, Gorter R, Shepard KV. Dronabinol stimulates appetite and causes weight gain in HIV patients. *International Conference on AIDS* 1992;8(3):122 (abstract no. PuB 7442).
- Struwe M, Kaempfer SH, Geiger CJ, Pavia AT, Plasse TF, Shepard KV, Ries K, Evans TG. Effect of dronabinol on nutritional status in HIV infection. *Annals of Pharmacotherapy* 1993;27:827-831.
- Beal JE, Olson R, Lefkowitz L, Laubenstein L, Bellman P, Yangco B, Morales JO, Murphy R, Powderly W, Plasse TF, Mosdell KW, Shepard KV. Long-term efficacy and safety of dronabinol for acquired immunodeficiency syndrome-associated anorexia. *Journal of Pain and Symptom Management* 1997;14(1):7-14.

- Dejesus E, Rodwick BM, Bowers D, Cohen CJ, Pearce D. Use of dronabinol improves appetite and reverses weight loss in HIV/AIDS-infected patients. *J Int Assoc Physicians AIDS Care* 2007;6(2):95-100.

Case Reports, Surveys

Cannabis (smoked)

- Prentiss D, Power R, Balmas G, Tzuang G, Israelski DM. Patterns of marijuana use among patients with HIV/AIDS followed in a public health care setting. *J Acquir Immune Defic Syndr* 2004;35(1):38-45.
- Woolridge E, Barton S, Samuel J, Osorio J, Dougherty A, Holdcroft A. Cannabis use in HIV for pain and other medical symptoms. *J Pain Symptom Manage* 2005;29(4):358-67.
- Sidney S. Marijuana use in HIV-positive and AIDS patients: Results of a an anonymous mail survey. *J Cannabis Ther* 2001;1(3-4):35-43.
- Corless IB, Lindgren T, Holzemer W, Robinson L, Moezzi S, Kirksey K, Coleman C, Tsai YF, Sanzero Eller L, Hamilton MJ, Sefcik EF, Canaval GE, Rivero Mendez M, Kemppainen JK, Bunch EH, Nicholas PK, Nokes KM, Dole P, Reynolds N. Marijuana Effectiveness as an HIV Self-Care Strategy. *Clin Nurs Res* 2009;18(2):172-93.

Appetite Loss – Cancer

Controlled Studies

Dronabinol

- Jatoi A, Windschitl HE, Loprinzi CL, Sloan JA, Dakhil SR, Mailliard JA, Pundaleeka S, Kardinal CG, Fitch TR, Krook JE, Novotny PJ, Christensen B. Dronabinol versus megestrol acetate versus combination therapy for cancer-associated anorexia: a North Central Cancer Treatment Group study. *Journal of Clinical Oncology* 2002;20(2):567-573.
- Regelson W, Butler JR, Schulz J, Kirk T, Peek L, Green ML, Zalis MO. Delta-9-tetrahydrocannabinol as an effective antidepressant and appetite-stimulating agent in advanced cancer patients. In: Braude MC, Szara S, editors. *Pharmacology of marihuana*. Vol 2. New York: Raven Press, 1976. p. 763-776.
- Wadleigh R, Spaulding GM, Lumbersky B, Zimmer M, Shepard K, Plasse T. Dronabinol enhancement of appetite in cancer patients. *Proc Am Soc Oncology* 1990; 9: 331.
- Strasser F, Luftner D, Possinger K, Ernst G, Ruhstaller T, Meissner W, Ko YD, Schnelle M, Reif M, Cerny T. 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. *J Clin Oncol* 2006;24(21):3394-400.
- Brisbois TD, de Kock IH, Watanabe SM, Mirhosseini M, Lamoureux DC, Chasen M, Macdonald N, Baracos VE, Wismer WV. Delta-9-tetrahydrocannabinol may palliate altered chemosensory perception in cancer patients: results of a randomized, double-blind, placebo-controlled pilot trial. *Ann Oncol*. 2011 Feb 22. [Epub ahead of print]

Nabilone

- Turcott JG, Del Rocío Guillen Núñez M, Flores-Estrada D, Oñate-Ocaña LF, Zatarain-Barrón ZL, Barrón F, Arrieta O. The effect of nabilone on appetite, nutritional status, and quality of life in lung cancer patients: a randomized, double-blind clinical trial. *Support Care Cancer*. 2018 Mar 17. [Epub ahead of print]

Cannabis (oral, sublingual)

- Strasser F, Luftner D, Possinger K, Ernst G, Ruhstaller T, Meissner W, Ko YD, Schnelle M, Reif M, Cerny T. 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. *J Clin Oncol* 2006;24(21):3394-400.

Uncontrolled Studies

Dronabinol

- Plasse TF, Gorter RW, Krasnow SH, Lane M, Shepard KV, Wadleigh RG. Recent clinical experience with dronabinol. *Pharmacology, Biochemistry and Behavior* 1991;40:695-700.
- Nelson K, Walsh D, Deeter P, Sheehan F. A phase II study of delta-9-tetrahydrocannabinol for appetite stimulation in cancer-associated anorexia. *Journal of Palliative Care* 1994;10:14-18.
- Gottschling S. [Cannabinoids in children] [Article in German] Cannabinoide bei Kindern. *Angewandte Schmerztherapie und Palliativmedizin* 2011;(1):55-57.

Cannabis (smoked)

- Waissengrin B, Urban D, Leshem Y, Garty M, Wolf I. Patterns of Use of Medical Cannabis Among Israeli Cancer Patients: A Single Institution Experience. *J Pain Symptom Manage.* 2015;49(2):223-30.

Appetite Loss – Alzheimer's Disease

Controlled Studies

Dronabinol

- Volicer L, Stelly M, Morris J, McLaughlin J, Volicer BJ. Effects of dronabinol on anorexia and disturbed behavior in patients with Alzheimer's disease. *International Journal of Geriatric Psychiatry* 1997;12:913-919.

Uncontrolled Studies

Dronabinol

- Patel S, Shua-Haim JR, Pass M. Safety and efficacy of dronabinol in the treatment of agitation in patients with Alzheimer's disease with anorexia: A retrospective chart review. Abstract, 11th International Conference of the IPA, 17-22 August 2003, Chicago.

Appetite Loss – Geriatrics

Uncontrolled Studies

Dronabinol

- Wilson MM, Philpot C, Morley JE. Anorexia of aging in long term care: is dronabinol an effective appetite stimulant? - a pilot study. *J Nutr Health Aging* 2007;11(2):195-8.

Appetite Loss - Anorexia nervosa

Controlled Studies

Dronabinol

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Uncontrolled Studies

THC

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Appetite Loss – COPD

Uncontrolled Studies

Dronabinol

- Bergmann K-C. [Dronabinol, a possible new therapeutic option in patients with COPD and pulmonal cachexia] [Article in German]. Abstract, 2005 Conference of the German Society for Pneumology, 17 March 2005, Berlin.

Appetite Loss – Healthy Subjects

Uncontrolled Studies

Cannabis (smoked)

- Morgan CJ, Freeman TP, Schafer GL, Curran HV. Cannabidiol attenuates the appetitive effects of Delta 9-tetrahydrocannabinol in humans smoking their chosen cannabis. *Neuropsychopharmacology*. 2010;35(9):1879-85.

Controlled Studies

Cannabis (smoked)

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Spasticity – Multiple Sclerosis

Controlled Studies

Dronabinol

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Nabilone

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Cannabis (oral, sublingual)

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placebo-controlled study on 160 patients. *Multiple Sclerosis* 2004;10(4):434-41.

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Cannabis (smoked)

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Uncontrolled Studies

Cannabis (smoked)

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Cannabis (oral, sublingual)

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Case Reports, Surveys

Dronabinol

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Cannabis (smoked)

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Cannabis (oral, sublingual)

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Spasticity – Spinal Cord Injury

Controlled Studies

Dronabinol

- Hanigan WC, Destree R, Truong XT. The effect of Δ^9 -THC on human spasticity. *Clinical Pharmacology and Therapeutics* 1986;39:198.
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Controlled Studies

Nabilone

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Uncontrolled Studies

Dronabinol

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Cannabis (oral, sublingual)

- Grao-Castellote C, Torralba-Collados F, Gonzalez LM, Giner-Pascual M. Delta-9-tetrahydrocannabinol-cannabidiol in the treatment of spasticity in chronic spinal cord injury: a clinical experience. *Rev Neurol*. 2017;65(7):295-302.

Case Reports, Surveys

Cannabis (smoked)

- Malec J, Harvey RF, Cayner JJ. Cannabis effect on spasticity in spinal cord injury. *Archives of Physical Medicine and Rehabilitation* 1982;63:116-118.
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Spasticity – Different Causes

Controlled Studies

Cannabis (oral, sublingual)

- Wade DT, Robson P, House H, Makela P, Aram J. A preliminary controlled study to determine whether whole-plant cannabis extracts can improve intractable neurogenic symptoms. *Clinical Rehabilitation* 2003;17:18-26.

Dronabinol

- Kuhlen M, Hoell JI, Gagnon G, Balzer S, Oommen PT, Borkhardt A, Janßen G. Effective treatment of spasticity using dronabinol in pediatric palliative care. *Eur J Paediatr Neurol*. 2016;20(6):898-903.

Case Reports, Surveys

Cannabis (oral, sublingual)

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Uncontrolled Studies

Dronabinol

- Brenneisen R, Egli A, Elsohly MA, Henn V, Spiess Y. The effect of orally and rectally administered delta-9-tetrahydrocannabinol on spasticity: a pilot study with 2 patients. *International Journal of Clinical Pharmacology and Therapeutics* 1996;34:446-452.

Case Reports, Surveys

Dronabinol

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Cannabis (smoked)

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Pain – Chronic, Neuropathic/Multiple Sclerosis

Controlled Studies

Dronabinol

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Nabilone

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Cannabis (oral, sublingual)

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Cannabis (smoked)

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- Corey-Bloom J, Wolfson T, Gamst A, Jin S, Marcotte TD, Bentley H, Gouaux B. Smoked cannabis for spasticity in multiple sclerosis: a randomized, placebo-controlled trial. *CMAJ*. 2012;184(10):1143-50.

Cannabis (vaporized)

- Wilsey B, Marcotte T, Deutsch R, Gouaux B, Sakai S, Donaghe H. Low-dose vaporized cannabis significantly improves neuropathic pain. *J Pain*. 2013;14(2):136-48.
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Cannabis (inhaled)

- Eisenberg E, Ogintz M, Almog S. The Pharmacokinetics, Efficacy, Safety, and Ease of Use of a Novel Portable Metered-Dose Cannabis Inhaler in Patients With Chronic Neuropathic Pain: A Phase 1a Study. *J Pain Palliat Care Pharmacother*. 2014;28(3):216-25.
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Cannabidiol

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CT-3 (Ajulemic Acid)

- Karst M, Salim K, Burstein S, Conrad I, Hoy L, Schneider U. Analgesic effect of the synthetic cannabinoid CT-3 on chronic neuropathic pain: a randomized controlled trial. *JAMA* 2003;290(13):1757-62.

ASP8477

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Uncontrolled Studies

Dronabinol

- Clermont-Gnamien S, Atlani S, Attal N, Le Mercier F, Guirimand F, Brasseur L. [The therapeutic use of D9-tetrahydrocannabinol (dronabinol) in refractory neuropathic pain] [Article in French] *Presse Med* 2002;31(39 Pt 1):1840-5.
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Cannabis (oral, sublingual)

- Rog DJ, Nurmikko TJ, Young CA. Oromucosal delta-9-tetrahydrocannabinol/cannabidiol for neuropathic pain associated with multiple sclerosis: an uncontrolled, open-label, 2-year extension trial. *Clin Ther* 2007;29(9):2068-79.
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Nabilone (oral)

- Toth C, Au S. A prospective identification of neuropathic pain in specific chronic polyneuropathy syndromes and response to pharmacological therapy. *Pain* 2008;138(3):657-66.
- Bestard JA, Toth CC. An Open-Label Comparison of Nabilone and Gabapentin as Adjuvant Therapy or Monotherapy in the Management of Neuropathic Pain in Patients with Peripheral Neuropathy. *Pain Pract.* 2010 Nov 18. doi: 10.1111/j.1533-2500.2010.00427.x. [Epub ahead of print]

Case Reports, Surveys

Cannabis (smoked)

- Dunn M, Davis R. The perceived effects of marijuana on spinal cord injured males. *Paraplegia* 1974;12:175.
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- Chong MS, Wolff K, Wise K, Tanton C, Winstock A, Silber E. Cannabis use in patients with multiple sclerosis. *Mult Scler* 2006;12(5):646-51.

Cannabis (smoked)

- Hesselink JM, Kopsky DJ. Intractable neuropathic pain due to ulnar nerve entrapment treated with cannabis and ketamine 10%. *J Clin Anesth.* 2012;24(1):78-9.

Cannabis (oral, sublingual)

- Notcutt WG. A questionnaire survey of patients and carers of patients prescribed Sativex as an unlicensed medicine. *Prim Health Care Res Dev.* 2013 Apr;14(2):192-9.

Pain – Chronic, Cancer

Controlled Studies

Dronabinol

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Cannabis (oral, sublingual)

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Benzopyranoperidine

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NIB

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Uncontrolled Studies

Dronabinol

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Nabilone

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Cannabis (oral, sublingual)

- Johnson JR, Lossignol D, Burnell-Nugent M, Fallon MT. An open-label extension study to investigate the long-term safety and tolerability of THC/CBD oromucosal spray and oromucosal THC spray in patients with terminal cancer-related pain refractory to strong opioid analgesics. *J Pain Symptom Manage*. 2013;46(2):207-18.

Cannabis (smoked)

- Waissengrin B, Urban D, Leshem Y, Garty M, Wolf I. Patterns of Use of Medical Cannabis Among Israeli Cancer Patients: A Single Institution Experience. *J Pain Symptom Manage*. 2015;49(2):223-30.
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Pain – Rheumatic

Controlled Studies

Cannabis (oral, sublingual)

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Pain - Fibromyalgia

Controlled Studies

Nabilone

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Uncontrolled Studies

Dronabinol

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Cannabis (smoked)

- Habib G, Artul S. Medical Cannabis for the Treatment of Fibromyalgia. *J Clin Rheumatol*. 2018 Feb 14. [Epub ahead of print]

Case Reports, Surveys

Cannabis (smoked)

- Fiz J, Duran M, Langohr K, Capellà D, Farré M. Symptoms relief and improved mental health in fibromyalgia patients using cannabis. Results of an observational study. *IACM 4th Conference on*

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Pain – Chronic

Controlled Studies

Dronabinol

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Cannabis (oral, sublingual)

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Cannabis (smoked)

- Ware MA, Ducruet T, Robinson AR. Evaluation of herbal cannabis characteristics by medical users: a randomized trial. *Harm Reduct J* 2006;3(1):32.

Cannabis (vaporized)

- Wilsey BL, Deutsch R, Samara E, Marcotte TD, Barnes AJ, Huestis MA, Le D. A preliminary evaluation of the relationship of cannabinoid blood concentrations with the analgesic response to vaporized cannabis. *J Pain Res*. 2016;9:587-98.

Nabilone

- Pingsger M, Schimetta W, Volc D, Hiermann E, Riederer F, Polz W. [Benefits of an add-on treatment with the synthetic cannabinomimetic nabilone on patients with chronic pain - a randomized controlled trial.] [Article in German] *Wien Klin Wochenschr* 2006;118(11-12):327-35.

N-palmitoylethanolamine (topical)

- Phan NQ, Siepmann D, Gralow I, Ständer S. Adjuvant topical therapy with a cannabinoid receptor agonist in facial postherpetic neuralgia. *J Dtsch Dermatol Ges* 2010;8(2):88-91.

THC

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Treatment in Men With Chronic Prostatitis/Chronic Pelvic Pain Syndrome: An Adaptive Double-blind, Randomized Controlled Trial. *Urology*. 2017;103:191-197.

Uncontrolled Studies

Cannabis (oral, sublingual)

- Haroutiunian S, Rosen G, Shouval R, Davidson E. Open-label, add-on study of tetrahydrocannabinol for chronic nonmalignant pain. *J Pain Palliat Care Pharmacother* 2008;22(3):213-7.

Nabilone

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Palmitoylethanolamine (PEA)

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Case Reports, Surveys

Dronabinol

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Cannabis (smoked)

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Cannabis (vaporized/oral)

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Pain – Acute, Surgery

Controlled Studies

Dronabinol

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Cannabis (oral, sublingual)

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Cannabis

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Nabilone

- Beaulieu P. Effects of nabilone, a synthetic cannabinoid, on postoperative pain. *Can J Anaesth* 2006;53(8):769-75.

Levonantradol

- Jain AK, Ryan JR, McMahon FG, Smith G. Evaluation of intramuscular levonantradol and placebo in acute postoperative pain. *Journal of Clinical Pharmacology* 1981;21(suppl 8-9):S320-S326.
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Uncontrolled Studies

Cannabidiol

- Cuñetti L, Manzo L, Peyraube R, Arnaiz J, Curi L, Orihuela S. Chronic Pain Treatment With Cannabidiol in Kidney Transplant Patients in Uruguay. *Transplant Proc.* 2018;50(2):461-464.

Case Reports, Surveys

Cannabis

- Heng M, McTague MF, Lucas RC, Harris MB, Vrahas MS, Weaver MJ. Patient Perceptions of the Use of Medical Marijuana in the Treatment of Pain After Musculoskeletal Trauma: A Survey of Patients at 2 Trauma Centers in Massachusetts. *J Orthop Trauma.* 2018;32(1):e25-e30.
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Cannabis (topical)

- Maida V, Corban J. Topical Medical Cannabis: A New Treatment for Wound Pain-Three Cases of

Pyoderma Gangrenosum. *J Pain Symptom Manage.* 2017;54(5):732-736.

Pain – Acute, Healthy Subjects

Controlled Studies

Dronabinol

- Naef M, Curatolo M, Petersen-Felix S, Arendt-Nielsen L, Zbinden A, Brenneisen R. The analgesic effect of oral delta-9-tetrahydrocannabinol (THC), morphine, and a THC-morphine combination in healthy subjects under experimental pain conditions. *Pain* 2003;105(1-2):79-88.
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Nabilone

- Redmond WJ, Goffaux P, Potvin S, Marchand S. Analgesic and antihyperalgesic effects of nabilone on experimental heat pain. *Curr Med Res Opin* 2008;24(4):1017-24.
- Kalliomäki J, Philipp A, Baxendale J, Annas P, Karlsten R, Segerdahl M. Lack of effect of central nervous system-active doses of nabilone on capsaicin-induced pain and hyperalgesia. *Clin Exp Pharmacol Physiol.* 2012;39(4):336-42.

Cannabis (smoked)

- Greenwald MK, Stitzer ML. Antinociceptive, subjective and behavioral effects of smoked marijuana in humans. *Drug Alcohol Depend* 2000;59(3):261-75.
- Wallace M, Schulteis G, Atkinson JH, Wolfson T, Lazzaretto D, Bentley H, Gouaux B, Abramson I. Dose-dependent effects of smoked cannabis on capsaicin-induced pain and hyperalgesia in healthy volunteers. *Anesthesiology* 2007;107(5):785-796.
- Cooper ZD, Comer SD, Haney M. Comparison of the analgesic effects of dronabinol and smoked marijuana in daily marijuana smokers. *Neuropsychopharmacology.* 2013;38(10):1984-92.

Cannabis (oral, sublingual)

- Kraft B, Frickey NA, Kaufmann RM, Reif M, Frey R, Gustorff B, Kress HG. Lack of analgesia by oral standardized cannabis extract on acute inflammatory pain and hyperalgesia in volunteers. *Anesthesiology* 2008;109(1):101-10.

Uncontrolled Studies

THC

- van Amerongen G, Siebenga P, de Kam ML, Hay JL, Groeneveld GJ. Effect profile of paracetamol, Δ9-THC and promethazine using an evoked pain test battery in healthy subjects. *Eur J Pain.* 2018. doi: 10.1002/ejp.1222. [Epub ahead of print]

Cannabis (smoked)

- Hill SY, Schwin R, Goodwin DW, Powell B. Marijuana and pain. *J Pharmacol Exp Ther* 1974;188:415-8.
- Clark WC, Janal MN, Zeidenberg P, Nahas GG. Effects of moderate and high doses of marijuana on thermal pain: a sensory decision theory analysis. *J Clin Pharmacol* 1981;21(8-9 Suppl):299S-310S.

Headache/Migraine

Uncontrolled Studies

Cannabis

- Rhyne DN, Anderson S, Gedde M, Borgelt LM. Effects of Medical Marijuana on Migraine Headache Frequency in an Adult Population. *Pharmacotherapy.* 2016;36(5):505-10.

Case Reports, Surveys

Dronabinol

- Raby WN, Modica PA, Wolintz RJ, Murtaugh K. Dronabinol reduces signs and symptoms of idiopathic intracranial hypertension: a case report. *J Ocul Pharmacol Ther* 2006;22(1):68-75.

Cannabis (smoked)

- Mortati K, Dworetzky B, Devinsky O. Marijuana: an effective antiepileptic treatment in partial epilepsy? A case report and review of the literature. *Rev Neurol Dis* 2007;4(2):103-6.
- Raby WN, Modica PA, Wolintz RJ, Murtaugh K. Dronabinol reduces signs and symptoms of idiopathic intracranial hypertension: a case report. *J Ocul Pharmacol Ther* 2006;22(1):68-75.
- Leroux E, Taifas I, Valade D, Donnet A, Chagnon M, Ducros A. Use of cannabis among 139 cluster headache sufferers. *Cephalalgia*. 2013;33(3):208-13.

Cannabis (historical)

- Russo EB. Hemp for headache: An in-depth historical and scientific review of cannabis in migraine treatment. *J Cannabis Ther* 2001;1(2):21-92.

HIV/AIDS – Disease Development

Uncontrolled Studies

Cannabis (smoked)

- Brunet L, Moodie EE, Rollet K, Cooper C, Walmsley S, Potter M, Klein MB; Canadian Co-infection Cohort Investigators. Marijuana smoking does not accelerate progression of liver disease in HIV-hepatitis C coinfection: a longitudinal cohort analysis. *Clin Infect Dis*. 2013;57(5):663-70.
- Milloy MJ, Marshall B, Kerr T, Richardson L, Hogg R, Guillemi S, Montaner JS, Wood E. High-intensity cannabis use associated with lower plasma human immunodeficiency virus-1 RNA viral load among recently infected people who use injection drugs. *Drug Alcohol Rev*. 2015;34(2):135-40.
- Keen L 2nd, Abbate A, Blanden G, Priddie C, Moeller FG, Rathore M. Confirmed marijuana use and lymphocyte count in black people living with HIV. *Drug Alcohol Depend*. 2017;180:22-25.
- Rizzo MD, Crawford RB, Henriquez JE, Aldhamen YA, Gulick P, Amalfitano A, Kaminski NE. HIV-infected cannabis users have lower circulating CD16+ monocytes and IFN- γ -inducible protein 10 levels compared with nonusing HIV patients. *AIDS*. 2018;32(4):419-429.

Case Reports, Surveys

Cannabis (smoked)

- Nordmann S et al. Daily cannabis and reduced risk of steatosis in human immunodeficiency virus and hepatitis C virus-co-infected patients. *J Viral Hepat*. 2018;25(2):171-179.

Amyotrophic Lateral Sclerosis

Controlled Studies

Dronabinol

- Weber M, Goldman B, Truniger S. Tetrahydrocannabinol (THC) for cramps in amyotrophic lateral sclerosis: a randomised, double-blind crossover trial. *J Neurol Neurosurg Psychiatry* 2010;81(10):1135-40.

Case Reports, Surveys

Cannabis (smoked)

- Amtmann D, Weydt P, Johnson KL, Jensen MP, Carter GT. Survey of cannabis use in patients with amyotrophic lateral sclerosis. *Am J Hosp Palliat Care* 2004;21(2):95-104.

Cannabidiol

- Nahler G. Co-medication with Cannabidiol May Slow Down the Progression of Motor Neuron Disease: A Case Report. *Journal of General Practice* 2017;5(4)

Bladder Dysfunction

Controlled Studies

Dronabinol

- Hagenbach U, Ghafoor N, Brenneisen R, Luz S, Mäder M. Clinical investigation of Δ -9-tetrahydrocannabinol (THC) as an alternative therapy for overactive bladders in spinal cord injury (SCI) patients? Abstract, 2001 Congress on Cannabis and the Cannabinoids, International Association for Cannabis as Medicine, 25-27 October 2001, Cologne, Germany.
- Freeman RM, Adekanmi O, Waterfield MR, Waterfield AE, Wright D, Zajicek J. The effect of cannabis on urge incontinence in patients with multiple sclerosis: a multicentre, randomised placebo-controlled trial (CAMS-LUTS). *Int Urogynecol J Pelvic Floor Dysfunct* 2006;17(6):636-41.

Cannabis (oral, sublingual)

- Brady CM, DasGupta R, Dalton C, Wiseman OJ, Berkley KJ, Fowler CJ. An open-label pilot study of cannabis-based extracts for bladder dysfunction in advanced multiple sclerosis. *Multiple Sclerosis* 2004;10(4):425-33.
- de Ridder D, Constantinescu CS, Fowler C, Kavia R, Sarantis N. Randomised controlled study of cannabis-based medicine (Sativex®) in patients suffering from multiple sclerosis associated detrusor overactivity. 22nd Congress of the ECTRIMS, 27-30 September 2006, Madrid, Spain.
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Controlled Studies

Cannabis (oral, sublingual)

- Maniscalco GT et al. THC/CBD oromucosal spray in patients with multiple sclerosis overactive bladder: a pilot prospective study. *Neurol Sci*. 2018;39(1):97-102.

Controlled Studies (Experimental in Healthy Subjects)

Dronabinol

- Beaumont H, Jensen J, Carlsson A, Ruth M, Lehmann A, Boeckxstaens GE. Effect of Delta(9)-tetrahydrocannabinol, a cannabinoid receptor agonist, on the triggering of transient lower oesophageal sphincter relaxations in dogs and humans. *Br J Pharmacol* 2009;156(1):153-62.

Gastroesophageal Reflux

Controlled Studies (Experimental in Healthy Subjects)

Dronabinol

- Beaumont H, Jensen J, Carlsson A, Ruth M, Lehmann A, Boeckxstaens GE. Effect of Delta(9)-tetrahydrocannabinol, a cannabinoid receptor agonist, on the triggering of transient lower oesophageal sphincter relaxations in dogs and humans. *Br J Pharmacol* 2009;156(1):153-62.

Irritable Bowel Syndrome, Diarrhoea

Controlled Studies (Experimental in Healthy Subjects)

Dronabinol

- Esfandyari T, Camilleri M, Busciglio I, Burton D, Baxter K, Zinsmeister AR. Effects of a cannabinoid receptor agonist on colonic motor and sensory functions in humans: a randomized, placebo-controlled

study. *Am J Physiol Gastrointest Liver Physiol* 2007;293(1):G137-45.

- Klooker TK, Liefeld KE, Van Den Wijngaard RM, Boeckstaens GE. The cannabinoid receptor agonist delta-9-tetrahydrocannabinol does not affect visceral sensitivity to rectal distension in healthy volunteers and IBS patients. *Neurogastroenterol Motil* 2011;23(1):30-5, e2.

Controlled Studies

Dronabinol

- Wong BS, Camilleri M, Eckert D, Carlson P, Ryks M, Burton D, Zinsmeister AR. Randomized pharmacodynamic and pharmacogenetic trial of dronabinol effects on colon transit in irritable bowel syndrome-diarrhea. *Neurogastroenterol Motil*. 2012;24(4):358-e169.

Palmitoylethanolamide

- Cremon C et al. Randomised clinical trial: the analgesic properties of dietary supplementation with palmitoylethanolamide and polydatin in irritable bowel syndrome. *Aliment Pharmacol Ther*. 2017;45(7):909-922.

Gastrointestinal disorders

Controlled Studies

Cannabis

- Naftali T, Bar-Lev Schleider L, Dotan I, Lansky EP, Sklerovsky Benjaminov F, Konikoff FM. Cannabis induces a clinical response in patients with Crohn's disease: a prospective placebo-controlled study. *Clin Gastroenterol Hepatol*. 2013;11(10):1276-1280.

Canabidiol

- Naftali T, Mechulam R, Marii A, Gabay G, Stein A, Bronshtain M, Laish I, Benjaminov F, Konikoff FM. Low-Dose Cannabidiol Is Safe but Not Effective in the Treatment for Crohn's Disease, a Randomized Controlled Trial. *Dig Dis Sci*. 2017;62(6):1615-1620.
- Irving PM et al. A Randomized, Double-blind, Placebo-controlled, Parallel-group, Pilot Study of Cannabidiol-rich Botanical Extract in the Symptomatic Treatment of Ulcerative Colitis. *Inflamm Bowel Dis*. 2018;24(4):714-724.

Uncontrolled Studies

Cannabis

- Lahat A, Lang A, Ben-Horin S. Impact of cannabis treatment on the quality of life, weight and clinical disease activity in inflammatory bowel disease patients: a pilot prospective study. *Digestion*. 2012;85(1):1-8.
- Ravikoff Allegretti J, Courtwright A, Lucci M, Korzenik JR, Levine J. Marijuana Use Patterns Among Patients with Inflammatory Bowel Disease. *Inflamm Bowel Dis* 2013;19(13):2809-14.

Burns

Case Reports, Surveys

Cannabis (historical)

- Williams F, Chrisco L, Nizamani R, Cairns B, Jones S. Marijuana Use is Protective in Burns. *Journal of Burn Care & Research* 2018;39, Issue suppl_1, Pages S198–S199.

Obstetrics and Gynecology

Case Reports, Surveys

Cannabis (historical)

- Russo E. Cannabis treatments in obstetrics and gynecology: A historical review. *J Cannabis Ther* 2002;2(3-4):5-35.

Tremor

Controlled Studies

Dronabinol

- Clifford DB. Tetrahydrocannabinol for tremor in multiple sclerosis. *Annals of Neurology* 1983;13:669-671.

Cannabis (oral, sublingual)

- Fox P, Bain PG, Glickman S, Carroll C, Zajicek J. The effect of cannabis on tremor in patients with multiple sclerosis. *Neurology* 2004;62(7):1105-9.

Dystonia

Uncontrolled Studies

Nabilone

- Fox SH, Kellett M, Moore AP, Crossman AR, Brotchie JM. Randomised, double-blind, placebo-controlled trial to assess the potential of cannabinoid receptor stimulation in the treatment of dystonia. *Movement Disorders* 2002;17(1):145-149.

Cannabidiol

- Snider SR, Consroe P. Treatment of Meige's syndrome with cannabidiol. *Neurology* 1984;34(Suppl):147.
- Sandyk R, Snider SR, Consroe P, Elias SM. Cannabidiol in dystonic movement disorders. *Psychiatry Research* 1986;18:291.
- Consroe P, Sandyk R, Snider SR. Open label evaluation of cannabidiol in dystonic movement disorders. *International Journal of Neuroscience* 1986;30:277-282.

L-Dopa-induced Dyskinesia (Tardive Dyskinesia)

Controlled Studies

Nabilone

- Sieradzan KA, Fox SH, Dick J, Brotchie JM. The effects of the cannabinoid receptor agonist nabilone on L-DOPA induced dyskinesia in patients with idiopathic Parkinson's disease (PD). *Movement Disorders* 1998;13(Suppl 2):29.

Case Reports, Surveys

Cannabis (smoked)

- Beckmann Y, Seçil Y, Güngör B, Yiğit T. Tardive Dystonia and the Use of Cannabis. *Turk Psikiyatri Derg* 2010;21(1):90-91.

Dronabinol

- Beckmann Y, Seçil Y, Güngör B, Yiğit T. Tardive Dystonia and the Use of Cannabis. *Turk Psikiyatri Derg* 2010;21(1):90-91.

Hiccups (Singultus)

Case Reports, Surveys

Cannabis (smoked)

- Gilson I, Busalacchi M. Marijuana for intractable hiccups. *Lancet* 1998; 351(9098): 267.

Tourette's Syndrome, Tics

Controlled Studies

Dronabinol

- Müller-Vahl KR, Schneider U, Koblenz A, Jobges M, Kolbe H, Daldrup T, Emrich HM. Treatment of Tourette's syndrome with Delta 9-tetrahydrocannabinol (THC): a randomized crossover trial. *Pharmacopsychiatry* 2002;35(2):57-61.
- Müller-Vahl KR, Schneider U, Prevedel H, Theloe K, Kolbe H, Daldrup T, Emrich HM. Delta 9-tetrahydrocannabinol (THC) is effective in the treatment of tics in Tourette syndrome: a 6-week randomized trial. *Journal of Clinical Psychiatry*. 2003;64(4):459-65.

Uncontrolled Studies

Dronabinol

- Müller-Vahl KR, Schneider U, Kolbe H, Emrich HM. Treatment of Tourette-Syndrome with delta-9-Tetrahydrocannabinol. *American Journal of Psychiatry* 1999;156:495.

Cannabis

- P Abi-Jaoude E, Chen L, Cheung P, Bhikram T, Sandor P. Preliminary Evidence on Cannabis Effectiveness and Tolerability for Adults With Tourette Syndrome. *J Neuropsychiatry Clin Neurosci*. 2017;29(4):391-400.

Case Reports, Surveys

Dronabinol

- Deutsch SI, Rosse RB, Connor JM, Burket JA, Murphy ME, Fox FJ. Current status of cannabis treatment of multiple sclerosis with an illustrative case presentation of a patient with MS, complex vocal tics, paroxysmal dystonia, and marijuana dependence treated with dronabinol. *CNS Spectr* 2008;13(5):393-403.
- Müller-Vahl KR, Schneider U, Emrich HM. Combined treatment of Tourette syndrome with delta-9-THC and dopamine receptor agonists. *J Cannabis Ther* 2002;2(3-4):145-54.
- Hasan A, Rothenberger A, Münchau A, Wobrock T, Falkai P, Roessner V. Oral delta9-tetrahydrocannabinol improved refractory Gilles de la Tourette syndrome in an adolescent by increasing intracortical inhibition: a case report. *J Clin Psychopharmacol* 2010;30(2):190-2.
- Brunbauer A, Segmiller FM, Volkamer T, Laux G, Müller N, Dehning S. Cannabinoids improve driving ability in a Tourette's patient. *Psychiatry Res*, 9 June 2011 [in press]
- Jakubovski E, Müller-Vahl K. Speechlessness in Gilles de la Tourette Syndrome: Cannabis-Based Medicines Improve Severe Vocal Blocking Tics in Two Patients. *Int J Mol Sci*. 2017;18(8).

Cannabis (smoked)

- Müller-Vahl KR, Kolbe H, Schneider U, Emrich HM. Cannabinoids: Possible role in pathophysiology of Gilles de la Tourette-syndrome. *Acta Psychiatrica Scandinavica* 1998;97:1-5.
- Sandyk R, Awerbuch G. Marijuana and Tourette's Syndrome. *Journal of Clinical Psychopharmacology* 1988;8:444-445.
- Hemming M, Yellowlees PM. Effective treatment of Tourette's syndrome with marijuana. *J Psychopharmacol* 1993; 7: 389-91.
- Abi-Jaoude E, Chen L, Cheung P, Bhikram T, Sandor P. Preliminary Evidence on Cannabis Effectiveness and Tolerability for Adults With Tourette Syndrome. *J Neuropsychiatry Clin Neurosci*. 2017;29(4):391-400.
- Jakubovski E, Müller-Vahl K. Speechlessness in Gilles de la Tourette Syndrome: Cannabis-Based Medicines Improve Severe Vocal Blocking Tics in Two Patients. *Int J Mol Sci*. 2017;18(8).

Hyperkinetic Movement Disorder

Case Reports, Survey

Dronabinol

- Farooq MU, Ducommun E, Goudreau J. Treatment of a hyperkinetic movement disorder during pregnancy with dronabinol. *Parkinsonism Relat Disord* 2009;15(3):249-51.

Attention-Deficit/Hyperactivity Disorder

Controlled Studies

Cannabis (oral, sublingual)

- Cooper RE, Williams E, Seegobin S, Tye C, Kuntsi J, Asherson P. Cannabinoids in attention-deficit/hyperactivity disorder: A randomised-controlled trial. *Eur Neuropsychopharmacol*. 2017;27(8):795-808.

Uncontrolled Studies

Cannabis (smoked)

- Aharonovich E, Garawi F, Bisaga A, Brooks D, Raby WN, Rubin E, Nunes EV, Levin FR. Concurrent cannabis use during treatment for comorbid ADHD and cocaine dependence: effects on outcome. *Am J Drug Alcohol Abuse*. 2006;32(4):629-35.

Case Reports, Surveys

Dronabinol

- Stroheck-Kuehner P, Skopp G, Mattern R. [Fitness to drive in spite (because) of THC] [Article in German]. *Arch Kriminol* 2007;220(1-2):11-9.

Cannabis (smoked)

- Stroheck-Kuehner P, Skopp G, Mattern R. [Fitness to drive in spite (because) of THC] [Article in German]. *Arch Kriminol* 2007;220(1-2):11-9.
- O'Connell TJ, Bou-Matar CB. Long term marijuana users seeking medical cannabis in California (2001-2007): demographics, social characteristics, patterns of cannabis and other drug use of 4117 applicants. *Harm Reduct J* 2007;4:16.

Obsessive Compulsive Disorder

Case Reports, Surveys

Dronabinol, Cannabis (smoked)

- Schindler F, Anghelescu I, Regen F, Jockers-Scherubl M. Improvement in refractory obsessive compulsive disorder with dronabinol. *Am J Psychiatry* 2008;165(4):536-7.
- Cooper JJ, Grant J. Refractory OCD Due to Thalamic Infarct With Response to Dronabinol. *J Neuropsychiatry Clin Neurosci*. 2017;29(1):77-78.

Parkinson's Disease

Controlled Studies

Cannabis (oral, sublingual)

- Carroll CB, Bain PG, Teare L, Liu X, Joint C, Wroath C, Parkin SG, Fox P, Wright D, Hobart J, Zajicek JP. Cannabis for dyskinesia in Parkinson disease: a randomized double-blind crossover study. *Neurology* 2004;63(7):1245-50.

Cannabidiol

- Chagas MH, Zuardi AW, Tumas V, Pena-Pereira MA, Sobreira ET, Bergamaschi MM, dos Santos AC, Teixeira AL, Hallak JE, Crippa JA. Effects of cannabidiol in the treatment of patients with Parkinson's disease: an exploratory double-blind trial. *J Psychopharmacol*. 2014;28(11):1088-98.

Uncontrolled Studies

Cannabis (smoked)

- Frankel JP, Hughes A, Lees AJ, Stern GM. Marijuana for Parkinsonian tremor. *Journal of Neurology, Neurosurgery and Psychiatry* 1990;53:436.
- Lotan I, Treves TA, Roditi Y, Djaldetti R. Cannabis (medical marijuana) treatment for motor and non-motor symptoms of Parkinson disease: an open-label observational study. *Clin Neuropharmacol.* 2014;37(2):41-4.

Case Reports, Surveys

Cannabis (smoked)

- Shohet A, Khlebtovsky A, Roizen N, Roditi Y, Djaldetti R. Effect of medical cannabis on thermal quantitative measurements of pain in patients with Parkinson's disease. *Eur J Pain.* 2017;21(3):486-493.
- Balash Y, Bar-Lev Schleider L, Korczyn AD, Shabtai H, Knaani J, Rosenberg A, Baruch Y, Djaldetti R, Giladi N, Gurevich T. Medical Cannabis in Parkinson Disease: Real-Life Patients' Experience. *Clin Neuropharmacol.* 2017;40(6):268-272.
- Kindred JH, Li K, Ketelhut NB, Proessel F, Fling BW, Honce JM, Shaffer WR, Rudroff T. Cannabis use in people with Parkinson's disease and Multiple Sclerosis: A web-based investigation. *Complement Ther Med.* 2017;33:99-104.

Huntington's Disease

Controlled Studies

Cannabidiol

- Consroe P, Laguna J, Allender J, Snider S, Stern L, Sandyk R, Kennedy K, Schram K. Controlled clinical trial of cannabidiol in Huntington's disease. *Pharmacology, Biochemistry and Behavior.* 1991;40(3):701-8.

Uncontrolled Studies

Nabilone

- ❖ Müller-Vahl KR, Schneider U, Emrich HM. Nabilone deteriorates choreatic movements in Huntington's disease. *Movement Disorders* 1999b;14:1038-40.

Cannabinoids

- Saft C, von Hein SM, Lücke T, Thiels C, Peball M, Djamshidian A, Heim B, Seppi K. Cannabinoids for Treatment of Dystonia in Huntington's Disease. *J Huntingtons Dis.* 2018 Mar 16. [Epub ahead of print]

Traumatic Brain Injury

Controlled Studies

Dexanabinol

- Maas AI, Murray G, Henney H 3rd, Kassem N, Legrand V, Mangelus M, Muizelaar JP, Stocchetti N, Knoller N; Pharms TBI investigators. Efficacy and safety of dexanabinol in severe traumatic brain injury: results of a phase III randomised, placebo-controlled, clinical trial. *Lancet Neurol* 2006;5(1):38-45.

KN38-7271

- Firsching R, Piek J, Skalej M, Rohde V, Schmidt U, Striggow F; the KN38-7271 Study Group. Early Survival of Comatose Patients after Severe Traumatic Brain Injury with the Dual Cannabinoid CB1/CB2 Receptor Agonist KN38-7271: A Randomized, Double-Blind, Placebo-Controlled Phase II Trial. *J Neurol Surg A Cent Eur Neurosurg.* 2012 Aug;73(4):204-16.

Uncontrolled Studies

Cannabis

- Nguyen BM, Kim D, Bricker S, Bongard F, Neville A, Putnam B, Smith J, Plurad D. Effect of marijuana

use on outcomes in traumatic brain injury. *Am Surg.* 2014;80(10):979-83.

Tinnitus

Case Reports, Surveys

Dronabinol/Cannabis (smoked)

- Raby WN, Modica PA, Wolintz RJ, Murtaugh K. Dronabinol reduces signs and symptoms of idiopathic intracranial hypertension: a case report. *J Ocul Pharmacol Ther* 2006;22(1):68-75.

Pruritus

Uncontrolled Studies

Cream with Endocannabinoids

- Szepietowski JC, Szepietowski T, Reich A. Efficacy and tolerance of the cream containing structured physiological lipids with endocannabinoids in the treatment of uremic pruritus: a preliminary study. *Acta Dermatovenerol Croat* 2005;13(2):97-103.
- Ständer S, Reinhardt HW, Luger TA. [Topical cannabinoid agonists: An effective new possibility for treating chronic pruritus.] [Article in German]. *Hautarzt* 2006;57(9):801-7.

Case Reports, Surveys

Dronabinol

- Neff GW, O'Brien CB, Reddy KR, Bergasa NV, Regev A, Molina E, Amaro R, Rodriguez MJ, Chase V, Jeffers L, Schiff E. Preliminary observation with dronabinol in patients with intractable pruritus secondary to cholestatic liver disease. *Am J Gastroenterol* 2002;97(8):2117-9.

Night Sweats

Uncontrolled Studies

Nabilone

- Maida V. Nabilone for the treatment of paraneoplastic night sweats: a report of four cases. *J Palliat Med* 2008;11(6):929-34.

Epilepsy

Case Reports

Cannabis

- Hegde M, Santos-Sanchez C, Hess CP, Kabir AA, Garcia PA. Seizure exacerbation in two patients with focal epilepsy following marijuana cessation. *Epilepsy Behav* 2012;25(4):563-6.

Cannabidiol

- Warren PP, Bebin EM, Nabors LB, Szaflarski JP. The use of cannabidiol for seizure management in patients with brain tumor-related epilepsy. *Neurocase.* 2017;23(5-6):287-291.

Controlled Studies

Cannabidiol

- Cunha JM, Carlini EA, Pereira AE, Ramos OL, Pimentel C, Gagliardi R, Sanvito WL, Lander N, Mechoulam R. Chronic administration of cannabidiol to healthy volunteers and epileptic patients. *Pharmacology* 1980;21(3):175-85.
- Tzadok M, Uliel-Siboni S, Linder I, Kramer U, Epstein O, Menascu S, Nissenkorn A, Yosef OB, Hyman E, Granot D, Dor M, Lerman-Sagie T, Ben-Zeev B. CBD-enriched medical cannabis for intractable pediatric epilepsy: The current Israeli experience. *Seizure.* 2016;35:41-4.

- Devinsky O, Cross JH, Laux L, Marsh E, Miller I, Nabbout R, Scheffer IE, Thiele EA, Wright S; Cannabidiol in Dravet Syndrome Study Group. Trial of Cannabidiol for Drug-Resistant Seizures in the Dravet Syndrome. *N Engl J Med.* 2017;376(21):2011-2020.
- Devinsky O. et al. Randomized, dose-ranging safety trial of cannabidiol in Dravet syndrome. *Neurology.* 2018;90(14):e1204-e1211.
- Thiele EA. et al. Cannabidiol in patients with seizures associated with Lennox-Gastaut syndrome (GWPCARE4): a randomised, double-blind, placebo-controlled phase 3 trial. *Lancet.* 2018;391(10125):1085-1096.

Uncontrolled Studies

Cannabis (smoked)

- Consroe PF, Wood GC, Buchsbaum H. Anticonvulsant nature of marijuana smoking. *JAMA* 1975;234(3):306-7.

Cannabis (oral, sublingual)

- Press CA, Knupp KG, Chapman KE. Parental reporting of response to oral cannabis extracts for treatment of refractory epilepsy. *Epilepsy Behav.* 2015;45:49-52.

Cannabidiol

- Ames FR, Cridland S.: Anticonvulsant effect of cannabidiol [letter]. *South African Medical Journal* 1986;69:14.
- Trembly B, Sherman M. Double-blind clinical study of cannabidiol as a secondary anticonvulsant. Conference on Cannabis and Cannabinoids, Kolympari/Crete, July 1990, cited according to: Consroe P, Sandyk R. Potential role of cannabinoids for therapy of neurological disorders. In: Murphy L, Bartke A, eds. *Marijuana/Cannabinoids, Neurobiology and Neurophysiology.* Boca Raton: CRC Press 1992, 459-524. [**Commentary:** No effect of Cannabidiol (300 mg/day) in 10 patients.]
- Trembly B, Sherman M. Double-blind clinical study of cannabidiol as a secondary anticonvulsant. Conference on Cannabis and Cannabinoids, Kolympari/Crete, July 1990, cited according to: Consroe P, Sandyk R. Potential role of cannabinoids for therapy of neurological disorders. In: Murphy L, Bartke A, eds. *Marijuana/Cannabinoids, Neurobiology and Neurophysiology.* Boca Raton: CRC Press 1992, 459-524. [**Commentary:** Reduction in Reduzierung in frequency of seizures with cannabidiol (900-1200 mg/day) in one patient.]
- Devinsky O, Marsh E, Friedman D, Thiele E, Laux L, Sullivan J, Miller I, Flamini R, Wilfong A, Filloux F, Wong M, Tilton N, Bruno P, Bluvstein J, Hedlund J, Kamens R, Maclean J, Nangia S, Singhal NS, Wilson CA, Patel A, Cilio MR. Cannabidiol in patients with treatment-resistant epilepsy: an open-label interventional trial. *Lancet Neurol.* 2016;15(3):270-8.
- Hess EJ, Moody KA, Geffrey AL, Pollack SF, Skirvin LA, Bruno PL, Paolini JL, Thiele EA. Cannabidiol as a new treatment for drug-resistant epilepsy in tuberous sclerosis complex. *Epilepsia.* 2016;57(10):1617-1624.
- Hausman-Kedem M, Menascu S, Kramer U. Efficacy of CBD-enriched medical cannabis for treatment of refractory epilepsy in children and adolescents - An observational, longitudinal study. *Brain Dev.* 2018 Apr 16. [Epub ahead of print]

Case Reports, Surveys

Cannabis (smoked)

- Corral VL. Differential effects of medical marijuana based on strain and route of administration: A three-year observational study. *J Cannabis Ther* 2001;1(3-4):43-59.
- Mortati K, Dworetzky B, Devinsky O. Marijuana: an effective antiepileptic treatment in partial epilepsy? A case report and review of the literature. *Rev Neurol Dis* 2007;4(2):103-6.
- Hamerle M, Ghaeni L, Kowski A, Weissinger F, Holtkamp M. Cannabis and other illicit drug use in epilepsy patients. *Eur J Neurol.* 2014;21(1):167-70.
- Massot-Tarrús A, McLachlan RS. Marijuana use in adults admitted to a Canadian epilepsy monitoring

unit. *Epilepsy Behav.* 2016;63:73-78.

Cannabidiol

- Gofshteyn JS, Wilfong A, Devinsky O, Bluvstein J, Charuta J, Ciliberto MA, Laux L, Marsh ED. Cannabidiol as a Potential Treatment for Febrile Infection-Related Epilepsy Syndrome (FIRES) in the Acute and Chronic Phases. *J Child Neurol.* 2017;32(1):35-40.
- Aguirre-Velázquez CG. Report from a Survey of Parents Regarding the Use of Cannabidiol (Medicinal cannabis) in Mexican Children with Refractory Epilepsy. *Neurol Res Int.* 2017;2017:2985729.
- Neubauer D, Perković Benedik M, Osredkar D. Cannabidiol for treatment of refractory childhood epilepsies: Experience from a single tertiary epilepsy center in Slovenia. *Epilepsy Behav.* 2018;81:79-85.

Isaacs' Syndrome

Case Report

Dronabinol

- Meyniel C, Ollivier Y, Hamidou M, Péréon Y, Derkinderen P. Dramatic improvement of refractory Isaacs' syndrome after treatment with dronabinol. *Clin Neurol Neurosurg.* 2010 Dec 6. [Epub ahead of print]

Intraocular Pressure - Glaucoma

Controlled Studies

Cannabis (smoked)

- Crawford WJ, Merritt JC. Effects of tetrahydrocannabinol on arterial and intraocular hypertension. *International Journal of Clinical Pharmacology and Biopharmacy* 1979;17(5):191-196.
- Merritt JC, Crawford WJ, Alexander PC, Anduze AL, Gelbart SS. Effect of marijuana on intraocular and blood pressure in glaucoma. *Ophthalmology* 1980;87(3):222-8.

Dronabinol

- Tomida I, Azuara-Blanco A, House H, Flint M, Pertwee RG, Robson PJ. Effect of sublingual application of cannabinoids on intraocular pressure: a pilot study. *J Glaucoma* 2006;15(5):349-353.

Cannabidiol

- Tomida I, Azuara-Blanco A, House H, Flint M, Pertwee RG, Robson PJ. Effect of sublingual application of cannabinoids on intraocular pressure: a pilot study. *J Glaucoma* 2006;15(5):349-353.

Uncontrolled Studies

Cannabis (smoked)

- Hepler RS, Frank IM, Petrus R. Ocular effects of marijuana smoking. In: Braude MC, Szara S, eds. *The pharmacology of marijuana.* Raven Press: New York: 1976;815-828.

Case Reports, Surveys

Cannabis (smoked)

- Russo EB, Mathre ML, Byrne A, Velin R, Bach PJ, Sanchez-Ramos J, et al. Chronic cannabis use in the Compassionate Investigational New Drug Program: An examination of benefits and adverse effects of legal clinical cannabis. *J Cannabis Ther* 2002;2(1):3-57.

Topical Administration

Dronabinol

- Merritt JC, Perry DD, Russell DN, Jones BF. Topical delta 9-tetrahydrocannabinol and aqueous dynamics in glaucoma. *Journal of Clinical Pharmacology* 1981;21(8-9 Suppl):467S-471S.

Intraocular Pressure - Healthy Subjects

Controlled Studies

Dronabinol

- Cooler P, Gregg JM. Effect of delta-9-tetrahydrocannabinol on intraocular pressure in humans. *Southern Medical Journal* 1977;70(8):951-954.
- Jones RT, Benowitz N, Herning RI. The clinical relevance of cannabis tolerance and dependence. *Journal of Clinical Pharmacology* 1981;21:143S-152S.
- Levitt M, Wilson A, Bowman D, Kemel S, Krepert G, Marks V, Schipper H, Thomson G, Weinerman B, Weinerman R. Physiologic observations in a controlled clinical trial of the antiemetic effectiveness of 5, 10, and 15 mg of delta 9-tetrahydrocannabinol in cancer chemotherapy. Ophthalmologic implications. *J Clin Pharmacol* 1981;21(8-9 Suppl):103S-109S.

Delta-9-THC, Delta-8-THC, 11-OH-THC, CBD, CBN

- Perez-Reyes M, Wagner D, Wall ME, Davis KH. Intravenous administration of cannabinoids and intraocular pressure. In: Braude MC, Szara S, ed. *Pharmacology of marihuana*. New York: Raven Press, 1976;829-832.

Uncontrolled Studies

Dronabinol

- Plange N, Arend KO, Kaup M, Doehmen B, Adams H, Hendricks S, Cordes A, Huth J, Sponsel WE, Remky A. Dronabinol and retinal hemodynamics in humans. *Am J Ophthalmol* 2007;143(1):173-4.

Cannabis (smoked)

- Hepler RS, Frank IM. Marihuana smoking and intraocular pressure. *Journal of the American Medical Association* 1971;217:1392.
- Flom MC, Adams AJ, Jones RT. Marijuana smoking and reduced intraocular pressure in human eye: Drug action or epiphenomenon? *Investigative Ophthalmology* 1975;14:52-55.
- Hepler R S, Frank I M, Petrus R. Ocular effects of marijuana smoking. In: Braude MC, Szara S, eds. *The pharmacology of marihuana*. New York: Raven Press, 1976;815-828.

Night Vision

Controlled Studies

Dronabinol

- Russo EB, Merzouki A, Molero Mesa J, Frey KA, Bach PJ. Cannabis improves night vision: A pilot study of dark adaptometry and scotopic sensitivity in kif smokers of the Rif Mountains of Northern Morocco. *J Ethnopharmacol* 2004;93(1):99-104.

Uncontrolled Studies

Cannabis (smoked)

- Russo EB, Merzouki A, Molero Mesa J, Frey KA, Bach PJ. Cannabis improves night vision: A pilot study of dark adaptometry and scotopic sensitivity in kif smokers of the Rif Mountains of Northern Morocco. *J Ethnopharmacol* 2004;93(1):99-104.

Asthma

Controlled Studies

Dronabinol

- Tashkin DP, Reiss S, Shapiro BJ, Calvarese B, Olsen JL, Lodge JW. Bronchial effects of aerosolized delta 9-tetrahydrocannabinol in healthy and asthmatic subjects. *American Review of Respiratory Disease* 1977;115(1):57-65.
- Williams SJ, Hartley JP, Graham JD. Bronchodilator effect of delta1-tetrahydrocannabinol

administered by aerosol of asthmatic patients. *Thorax* 1976;31(6):720-723.

Cannabis (smoked)

- Tashkin DP, Shapiro BJ, Lee YE, Harper CE. Effects of smoked marijuana in experimentally induced asthma. *American Review of Respiratory Disease* 1975;112(3):377-386.
- Vachon L, Mikus P, Morrissey W, FitzGerald M, Gaensler E. Bronchial effect of marijuana smoke in asthma. In: Braude MC, Szara S, eds. *The pharmacology of marijuana*. Raven Press: New York: 1976;777-784.

Nabilone

- Gong H Jr, Tashkin DP, Calvarese B. Comparison of bronchial effects of nabilone and terbutaline in healthy and asthmatic subjects. *Journal of Clinical Pharmacology* 1983;23(4):127-133

Uncontrolled Studies

Dronabinol

- Tashkin DP, Shapiro BJ, Frank IM. Acute effects of smoked marijuana and oral delta9-tetrahydrocannabinol on specific airway conductance in asthmatic subjects. *American Review for Respiratory Diseases*. 1974 Apr;109(4):420-8.

Cannabis (smoked)

- Tashkin DP, Shapiro BJ, Frank IM. Acute effects of smoked marijuana and oral delta9-tetrahydrocannabinol on specific airway conductance in asthmatic subjects. *American Review for Respiratory Diseases* 1974 Apr;109(4):420-8.

Bronchodilation - Healthy Subjects

Controlled Studies

Dronabinol

- Gong H Jr, Tashkin DP, Simmons MS, Calvarese B, Shapiro BJ. Acute and subacute bronchial effects of oral cannabinoids. *Clinical Pharmacology and Therapeutics* 1984;35(1):26-32.
- Tashkin DP, Reiss S, Shapiro BJ, Calvarese B, Olsen JL, Lodge JW. Bronchial effects of aerosolized delta 9-tetrahydrocannabinol in healthy and asthmatic subjects. *American Review of Respiratory Disease* 1977;115(1):57-65.

Nabilone

- Gong H Jr, Tashkin DP, Calvarese B. Comparison of bronchial effects of nabilone and terbutaline in healthy and asthmatic subjects. *Journal of Clinical Pharmacology* 1983;23(4):127-133.

COPD (Chronic Obstructive Pulmonary Disease)

Controlled Studies

Cannabis (oral, sublingual)

- Pickering EE, Semple SJ, Nazir MS, Murphy K, Snow TM, Cummin AR, Moosavi S, Guz A, Holdcroft A. Cannabinoid effects on ventilation and breathlessness: A pilot study of efficacy and safety. *Chron Respir Dis* 2011;8(2):109-18.
- Morris MA. et al. Marijuana Use Associations with Pulmonary Symptoms and Function in Tobacco Smokers Enrolled in the Subpopulations and Intermediate Outcome Measures in COPD Study. *Chronic Obstr Pulm Dis*. 2018;5(1):46-56.

Uncontrolled Studies

Cannabis (smoked)

- Ruppert AM et al. Effect of cannabis and tobacco on emphysema in patients with spontaneous pneumothorax. *Diagn Interv Imaging*. 2018 Mar 20. [Epub ahead of print]

Blood Pressure/Hypertension

Case Reports, Surveys

Cannabis (smoked)

- Vandrey R, Umbricht A, Strain EC. Increased Blood Pressure Following Abrupt Cessation of Daily Cannabis Use. *J Addict Med* 2011;5(1):16-20.

Controlled Studies

Cannabidiol

- Jadoon KA, Tan GD, O'Sullivan SE. A single dose of cannabidiol reduces blood pressure in healthy volunteers in a randomized crossover study. *JCI Insight*. 2017;2(12).

Cancer

Uncontrolled Studies

Dronabinol

- Guzmán M, Duarte MJ, Blázquez C, Ravina J, Rosa MC, Galve-Roperh I, Sánchez C, Velasco G, González-Feria L. A pilot clinical study of Delta9-tetrahydrocannabinol in patients with recurrent glioblastoma multiforme. *Br J Cancer* 2006;95(2):197-203.

Case Reports, Surveys

Cannabis (smoked)

- Liang C, McClean MD, Marsit C, Christensen B, Peters E, Nelson HH, Kelsey KT. A population-based case-control study of marijuana use and head and neck squamous cell carcinoma. *Cancer Prev Res (Phila Pa)* 2009;2(8):759-68.
- Foroughi M, Hendson G, Sargent MA, Steinbok P. Spontaneous regression of septum pellucidum/forniceal pilocytic astrocytomas-possible role of Cannabis inhalation. *Childs Nerv Syst* 2011;27(4):671-9.

Cannabis (topical)

- Maida V. Medical Cannabis in the Palliation of Malignant Wounds—A Case Report. *J Pain Symptom Manage*. 2017;53(1):e4-e6.

Alzheimer's Disease

Controlled Studies

Dronabinol

- Volicer L, Stelly M, Morris J, McLaughlin J, Volicer BJ. Effects of dronabinol on anorexia and disturbed behavior in patients with Alzheimer's disease. *International Journal of Geriatric Psychiatry* 1997;12:913-919.
- van den Elsen GA, Ahmed AI, Verkes RJ, Kramers C, Feuth T, Rosenberg PB, van der Marck MA, Olde Rikkert MG. Tetrahydrocannabinol for neuropsychiatric symptoms in dementia: A randomized controlled trial. *Neurology*. 2015;84(23):2338-46.
- van den Elsen GA, Tobben L, Ahmed AI, Verkes RJ, Kramers C, Marijnissen RM, Olde Rikkert MG, van der Marck MA. Effects of tetrahydrocannabinol on balance and gait in patients with dementia: A randomised controlled crossover trial. *J Psychopharmacol*. 2017;31(2):184-191.

Cannabis (oral, sublingual)

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Uncontrolled Studies

Dronabinol

- Patel S, Shua-Haim JR, Pass M. Safety and efficacy of dronabinol in the treatment of agitation in patients with Alzheimer's disease with anorexia: A retrospective chart review. Abstract, 11th International Conference of the IPA, 17-22 August 2003, Chicago.
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Nabilone

- Passmore MJ. The cannabinoid receptor agonist nabilone for the treatment of dementia-related agitation. *Int J Geriatr Psychiatry* 2008;23(1):116-7.

Neuroprotection

Case Reports, Surveys

Cannabis (smoked)

- Jacobus J, McQueeney T, Bava S, Schweinsburg BC, Frank LR, Yang TT, Tapert SF. White matter integrity in adolescents with histories of marijuana use and binge drinking. *Neurotoxicol Teratol* 2009;31(6):349-55.

Schizophrenic Psychosis

Controlled Studies

Cannabidiol

- ~~Leweke FM, Koethe D, Gerth CW, Nolden BM, Schreiber D, Hänsel A, Neatby MA, Juelicher A, Hellmich M, Klosterkötter J. Cannabidiol as an antipsychotic. A double blind, controlled clinical trial on cannabidiol vs. amisulpride in acute schizophrenia. IACM 3rd Conference on Cannabinoids in Medicine, 9-10 September 2005, Leiden, International Association for Cannabis as Medicine.~~
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Uncontrolled Studies

Cannabidiol

- Zuardi AW, Morais SL, Guimarães FS, Mechoulam R. Antipsychotic effect of cannabidiol. *Journal of Clinical Psychiatry* 1995;56:485-486.

Cannabis (smoked)

- Waterreus A, Badcock JC, Di Prinzio P, Martin-Iverson M, Morgan VA. The impact of current cannabis use on general cognitive function in people with psychotic illness. *Schizophr Res*. 2017;190:164-171.
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illicit substance abuse and risk of developing schizophrenia: a nationwide population based register study. *Psychol Med.* 2017;47(9):1668-1677.

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Case Reports, Surveys

Dronabinol

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- Schwarcz G, Karajgi B. Improvement in refractory psychosis with dronabinol: four case reports. *J Clin Psychiatry.* 2010;71(11):1552-3.

Cannabidiol

- Boggs DL et al. The effects of cannabidiol (CBD) on cognition and symptoms in outpatients with chronic schizophrenia a randomized placebo controlled trial. *Psychopharmacology (Berl).* 2018 Apr 5. [Epub ahead of print]

Case Reports, Surveys

Cannabis (smoked)

- Schwarcz G, Karajgi B, McCarthy R. Synthetic delta-9-tetrahydrocannabinol (dronabinol) can improve the symptoms of schizophrenia. *J Clin Psychopharmacol* 2009;29(3):255-8.
- Schwarcz G, Karajgi B. Improvement in refractory psychosis with dronabinol: four case reports. *J Clin Psychiatry.* 2010;71(11):1552-3.

Bipolar Disorder

Uncontrolled Studies

Cannabis (smoked)

- Sagar KA, Dahlgren MK, Racine MT, Dreman MW, Olson DP, Gruber SA. Joint Effects: A Pilot Investigation of the Impact of Bipolar Disorder and Marijuana Use on Cognitive Function and Mood. *PLoS One.* 2016;11(6):e0157060.

Case Reports, Surveys

Cannabis (smoked)

- Grinspoon L, Bakalar JB. The use of cannabis as a mood stabilizer in bipolar disorder: anecdotal evidence and the need for clinical research. *Journal of Psychoactive Drugs* 1998;30(2):171-7.
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Autism

Uncontrolled Studies

Anandamide

- Karhson DS, Krasinska KM, Dallaire JA, Libove RA, Phillips JM, Chien AS, Garner JP, Hardan AY, Parker KJ. Plasma anandamide concentrations are lower in children with autism spectrum disorder. *Mol Autism.* 2018 Mar 12;9:18.

Cannabidiol

- Aran A., Cassuto H., Lubotzky A. Cannabidiol Based Medical Cannabis in Children with Autism- a Retrospective Feasibility Study. *Neurology* 2018 (in press).

Depression

Controlled Studies

Dronabinol

- Regelson W, Butler JR, Schulz J, Kirk T, Peek L, Green ML, Zalis MO. Delta-9-tetrahydrocannabinol as an effective antidepressant and appetite-stimulating agent in advanced cancer patients. In: Braude MC, Szara S, editors. *Pharmacology of marijuana*. Vol 2. New York: Raven Press, 1976. p. 763-776.

Uncontrolled Studies

Cannabis (smoked)

- Cuttler C, Spradlin A, McLaughlin RJ. A naturalistic examination of the perceived effects of cannabis on negative affect. *J Affect Disord*. 2018;235:198-205.

Case Reports, Surveys

Cannabis (smoked)

- Ware MA, Adams H, Guy GW. The medicinal use of cannabis in the UK: results of a nationwide survey. *Int J Clin Pract* 2005;59(3):291-5.
- Feingold D, Rehm J, Lev-Ran S. Cannabis use and the course and outcome of major depressive disorder: A population based longitudinal study. *Psychiatry Res*. 2017;251:225-234.
- Feingold D, Brill S, Goor-Aryeh I, Delayahu Y, Lev-Ran S. Depression and anxiety among chronic pain patients receiving prescription opioids and medical marijuana. *J Affect Disord*. 2017;218:1-7.
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Anxiety

Controlled Studies

Cannabidiol

- Bergamaschi MM, Queiroz RH, Chagas MH, de Oliveira DC, De Martinis BS, Kapczinski F, Quevedo J, Roesler R, Schröder N, Nardi AE, Martín-Santos R, Hallak JE, Zuardi AW, Crippa JA. Cannabidiol Reduces the Anxiety Induced by Simulated Public Speaking in Treatment-Naïve Social Phobia Patients. *Neuropsychopharmacology*. 2011 Feb 9. [Epub ahead of print]
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Dronabinol

- Rabinak CA, Angstadt M, Sripada CS, Abelson JL, Liberzon I, Milad MR, Phan KL. Cannabinoid facilitation of fear extinction memory recall in humans. *Neuropharmacology*. 2013;64:396-402.
- Ballard ME, Bedi G, de Wit H. Effects of delta-9-tetrahydrocannabinol on evaluation of emotional images. *J Psychopharmacol*. 2012;26(10):1289-98.

Uncontrolled Studies

Cannabis (smoked)

- Cuttler C, Spradlin A, McLaughlin RJ. A naturalistic examination of the perceived effects of cannabis on negative affect. *J Affect Disord.* 2018;235:198-205.

Case Reports, Surveys

Cannabis (smoked)

- Piper BJ, DeKeuster RM, Beals ML, Cobb CM, Burchman CA, Perkinson L, Lynn ST, Nichols SD, Abess AT. Substitution of medical cannabis for pharmaceutical agents for pain, anxiety, and sleep. *J Psychopharmacol.* 2017;31(5):569-575.

Posttraumatic Stress Disorder

Case Reports, Surveys

Cannabis (smoked)

- Villagonzalo KA, Dodd S, Ng F, Mihaly S, Langbein A, Berk M. The relationship between substance use and posttraumatic stress disorder in a methadone maintenance treatment program. *Compr Psychiatry.* 2010 Nov 24. [Epub ahead of print]
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Uncontrolled Studies

THC (oral, sublingual)

- Roitman P, Mechoulam R, Cooper-Kazaz R, Shalev A. Preliminary, open-label, pilot study of add-on oral Δ^9 -tetrahydrocannabinol in chronic post-traumatic stress disorder. *Clin Drug Investig.* 2014;34(8):587-91.

Nabilone

- Cameron C, Watson D, Robinson J. Use of a synthetic cannabinoid in a correctional population for posttraumatic stress disorder-related insomnia and nightmares, chronic pain, harm reduction, and other indications: a retrospective evaluation. *J Clin Psychopharmacol.* 2014;34(5):559-64.

Cannabis (smoked)

- Ruglass LM, Shevorykin A, Radoncic V, Smith KM, Smith PH, Galatzer-Levy IR, Papini S, Hien DA. Impact of Cannabis Use on Treatment Outcomes among Adults Receiving Cognitive-Behavioral Treatment for PTSD and Substance Use Disorders. *J Clin Med.* 2017;6(2).

Controlled Studies

Nabilone

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Alcohol Dependency

Case Reports, Surveys

Cannabis (smoked)

- Mikuriya TH. Cannabis substitution. An adjunctive therapeutic tool in the treatment of alcoholism. *Medical Times* 1970;98(4):187-91.
- Mikuriya TH. Cannabis as a substitute for alcohol: a harm-reduction approach. *J Cannabis Ther* 2004;4(1):79-93.
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- Karoly HC, Bidwell LC, Mueller RL, Hutchison KE. Investigating the Relationships Between Alcohol Consumption, Cannabis Use, and Circulating Cytokines: A Preliminary Analysis. *Alcohol Clin Exp Res.* 2018;42(3):531-539.

Opioid Dependency

Case Reports, Surveys

Cannabis (smoked)

- Hermann D, Klages E, Welzel H, Mann K, Croissant B. Low efficacy of non-opioid drugs in opioid withdrawal symptoms. *Addict Biol* 2005;10(2):165-9.
- O'Connell TJ, Bou-Matar CB. Long term marijuana users seeking medical cannabis in California (2001-2007): demographics, social characteristics, patterns of cannabis and other drug use of 4117 applicants. *Harm Reduct J* 2007;4:16.
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Uncontrolled Studies

Cannabis (smoked)

- Raby WN, Carpenter KM, Rothenberg J, Brooks AC, Jiang H, Sullivan M, Bisaga A, Comer S, Nunes EV. Intermittent marijuana use is associated with improved retention in naltrexone treatment for opiate-dependence. *Am J Addict* 2009;18(4):301-8.
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on methadone maintenance treatment. *Am J Addict.* 2013;22(4):344-51.

Controlled Studies

Dronabinol

- Jicha CJ, Lofwall MR, Nuzzo PA, Babalonis S, Elayi SC, Walsh SL. Safety of oral dronabinol during opioid withdrawal in humans. *Drug Alcohol Depend.* 2015;157:179-83.

Cocaine/Crack Dependency

Uncontrolled Studies

Cannabis (smoked)

- Aharonovich E, Garawi F, Bisaga A, Brooks D, Raby WN, Rubin E, Nunes EV, Levin FR. Concurrent cannabis use during treatment for comorbid ADHD and cocaine dependence: effects on outcome. *Am J Drug Alcohol Abuse.* 2006;32(4):629-35.
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Case Reports, Surveys

Cannabis (smoked)

- Dreher M. Crack heads and roots daughters: The therapeutic use of cannabis in Jamaica. *J Cannabis Ther* 2002;2(3-4):121-33.

Cannabis Dependency

Controlled Studies

Dronabinol

- Haney M, Hart CL, Vosburg SK, Nasser J, Bennett A, Zubaran C, Foltin RW. Marijuana withdrawal in humans: effects of oral THC or divalproex. *Neuropsychopharmacology* 2004;29(1):158-70.
- Schlienz NJ, Lee DC, Stitzer ML, Vandrey R. The effect of high-dose dronabinol (oral THC) maintenance on cannabis self-administration. *Drug Alcohol Depend.* 2018;187:254-260.

Cannabis (oral, sublingual)

- Allsop DJ, Copeland J, Lintzeris N, Dunlop AJ, Montebello M, Sadler C, Rivas GR, Holland RM, Muhleisen P, Norberg MM, Booth J, McGregor IS. Nabiximols as an agonist replacement therapy during cannabis withdrawal: a randomized clinical trial. *JAMA Psychiatry.* 2014;71(3):281-91.

Uncontrolled Studies

Dronabinol

- Vandrey R, Stitzer ML, Mintzer MZ, Huestis MA, Murray JA, Lee D. The dose effects of short-term dronabinol (oral THC) maintenance in daily cannabis users. *Drug Alcohol Depend.* 2013;128(1-2):64-70.

Nabilone

- Haney M, Cooper ZD, Bedi G, Vosburg SK, Comer SD, Foltin RW. Nabilone decreases marijuana withdrawal and a laboratory measure of marijuana relapse. *Neuropsychopharmacology.* 2013;38(8):1557-65.

Case Reports, Surveys

Dronabinol

- Levin FR, Kleber HD. Use of dronabinol for cannabis dependence: two case reports and review. *Am J Addict* 2008;17(2):161-4.

Cannabidiol

- Crippa JA, Hallak JE, Machado-de-Sousa JP, Queiroz RH, Bergamaschi M, Chagas MH, Zuardi AW. Cannabidiol for the treatment of cannabis withdrawal syndrome: a case report. *J Clin Pharm Ther*. 2013;38(2):162-4.

Tobacco Dependency

Controlled Studies

Cannabidiol

- Hindocha C. et al. Cannabidiol reverses attentional bias to cigarette cues in a human experimental model of tobacco withdrawal. *Addiction*. 2018 May 1. [Epub ahead of print]

Liver Protection

Case Reports, Surveys

Cannabis (smoked)

- Adejumo AC, Ajayi TO, Adegbala OM, Adejumo KL, Alliu S, Akinjero AM, Onyeakusi NE, Ojelabi O, Bukong TN. Cannabis use is associated with reduced prevalence of progressive stages of alcoholic liver disease. *Liver Int*. 2018 Jan 17. [Epub ahead of print]

Sleep

Controlled Studies

Dronabinol, Cannabidiol

- Nicholson AN, Turner C, Stone BM, Robson PJ. Effect of Delta-9-tetrahydrocannabinol and cannabidiol on nocturnal sleep and early-morning behavior in young adults. *J Clin Psychopharmacol* 2004;24(3):305-13.
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Uncontrolled Studies

Dronabinol

- Prasad B, Radulovacki MG, Carley DW. Proof of concept trial of dronabinol in obstructive sleep apnea. *Front Psychiatry*. 2013;4:1.
- Farabi SS, Prasad B, Quinn L, Carley DW. Impact of Dronabinol on Quantitative Electroencephalogram (qEEG) Measures of Sleep in Obstructive Sleep Apnea Syndrome. *J Clin Sleep Med*. 2014;10(1):49-56.
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Restless Legs Syndrome

Case Reports, Surveys

Cannabis (smoked)

- Megelin T., Ghorayeb I. Cannabis for restless legs syndrome: a report of six patients. *Sleep Med*. 2017;36:182-183.

Different Diseases

Case Reports, Surveys

Cannabis (smoked)

- Grinspoon L, Bakalar JB. Marijuana, the forbidden medicine. Rev. and exp. ed. New Haven: Yale University Press; 1997.
- Randall RC, O'Leary AM. Marijuana Rx: The patients' fight for medicinal pot. New York: Thunder's Mouth Press; 1998.
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- Grotenhermen F, Schnelle M. Survey on the medical use of cannabis and THC in Germany. *J Cannabis Ther* 2003;3(2):17-40.
- Gieringer D. Medical use of cannabis: Experience in California. In: Grotenhermen F, Russo E, editors. *Cannabis and cannabinoids: Pharmacology, toxicology, and therapeutic potential*. Binghamton, NY: Haworth Press; 2001. p. 153-70.
- Ware MA, Adams H, Guy GW. The medicinal use of cannabis in the UK: results of a nationwide survey. *Int J Clin Pract* 2005;59(3):291-5.
- Russo EB, Mathre ML, Byrne A, Velin R, Bach PJ, Sanchez-Ramos J, et al. Chronic cannabis use in the Compassionate Investigational New Drug Program: An examination of benefits and adverse effects of legal clinical cannabis. *J Cannabis Ther* 2002;2(1):3-57.
- O'Connell TJ, Bou-Matar CB. Long term marijuana users seeking medical cannabis in California (2001-2007): demographics, social characteristics, patterns of cannabis and other drug use of 4117 applicants. *Harm Reduct J* 2007;4:16.
- Bottorff JL, Johnson JL, Moffat BM, Mulvogue T. Relief oriented use of marijuana by teens. *Subst Abuse Treat Prev Policy* 2009;4(1):7.