MDH Minnesota Department *of* Health

Minnesota Medical Cannabis Program
Petition to Add a Qualifying Medical Condition

Making your petition

- ☐ Any person may petition the Minnesota Department of Health ("the department" or "MDH") to add a qualifying medical condition to those listed in subdivision 14 of Minnesota Statutes section 152.22.

Petitions will be accepted only between June 1 and July 31, 2017.
Petitions received outside of these dates will not be reviewed.

Petitions must be sent by certified U.S. mail to:

Minnesota Department of Health
Office of Medical Cannabis
P.O. Box 64882
St. Paul, MN 55164-0882

- ☐ You must mail the original copy of the petition with an original signature.
- ☐ Complete each section of this petition and attach all supporting documents. Clearly indicate which section of the petition an attachment is for.
- ☐ Each petition is limited to one proposed qualifying medical condition. If your petition includes more than one medical condition, it will be dismissed.
- ☐ If you are petitioning for the addition of a medical condition that was considered but not approved in a prior year's petition process, you **must include** new scientific evidence or research to support your petition or describe substantially different symptoms. Please refer to our website to see which medical conditions were reviewed in prior years (http://www.health.state.mn.us/topics/cannabis/rulemaking/addconditions.html).
- ☐ If the petition is accepted for consideration, MDH will send the petition documents to the Medical Cannabis Review Panel ("Review Panel"). MDH staff will also provide information to the Review Panel about the proposed qualifying condition, its prevalence, and the effectiveness of current treatments.
- ☐ You may withdraw your petition any time before the Review Panel's first public meeting of the year by submitting a written statement to the Department stating that you want to withdraw it.

Petition review process

- ☐ An appointed citizens Review Panel will meet to review all eligible petitions.
- ☐ MDH will post notice of the public meetings of the Review Panel on its medical cannabis website.
- ☐ After the public meeting and by November 1, the Review Panel will provide the Commissioner of Health its written report of findings.
- ☐ The Commissioner will approve or deny the petition by December 1.

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Section A: Petitioner's Information			
Name (First, Middle, Last): [redacted]			
Home Address (including Apartment or Suite #): [redacted]			
City: [redacted]		State: MN	Zip Code: [redacted]
Telephone Number: [redacted]	E-mail Address: [redacted]		

Section B: Medical Condition You Are Requesting Be Added

Please specify the name and provide a brief description of the proposed qualifying medical condition. Be as precise as possible in identifying the condition. **Optional:** Include diagnostic code(s), citing the associated ICD-9 or ICD-10 code(s), if you know them. *Attach additional pages as needed.*

Dementia.

See attached Section B.

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Section C: Symptoms of the Proposed Medical Condition and/or Its Treatment

Describe the extent to which the proposed qualifying medical condition or the treatments cause suffering and impair a person's daily life. *Attach additional pages if needed.*

See attached Section C.

Section D. Availability of conventional medical therapies

Describe conventional medical therapies available and the degree to which they ease the suffering caused by the proposed qualifying medical condition or its treatment. *Attach additional pages if needed.*

See attached Section D.

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Section E: Anticipated benefits from Medical Cannabis

Describe the anticipated benefits from the medical use of cannabis specific to the proposed qualifying medical condition. *Attach additional pages if needed.*

See attached Section E.

Section F (optional): Scientific Evidence of Support for Medical Cannabis Treatment

It will strengthen your petition to include evidence generally accepted by the medical community and other experts supporting the use of medical cannabis to alleviate suffering caused by the proposed medical disease or its treatment. This includes but is not limited to full text, peer-reviewed published journals or other completed medical studies. Please attach complete copies of any article or reference, not abstracts.

☑ ***I have attached relevant articles.*** *(check box if you have attached scientific articles or studies)*

Section G (optional): Letters in Support of Adding the Medical Condition

Attach letters of support for the use of medical cannabis from persons knowledgeable about the proposed qualifying medical condition, such as a licensed health care professional.

☑ ***I have attached letters of support.*** *(check box if you have attached letters of support)*

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Section H: Acknowledgement and Signature

Please Note: Any individually identifiable health information relating to any past, present, or future health condition or health care contained in this Petition is classified as a health record under Minnesota Statutes §144.291, and is not subject to public disclosure.

I certify that the information provided in this petition is true and accurate to the best of my knowledge.

[redacted] 07/31/2017

SIGNATURE DATE (mm/dd/yyyy)

To obtain this information in a different format, call:
(651) 201-5598 in the Metro area and (844) 879-3381 in the Non-metro.

Section A: Petitioner's Information

[redacted]

Section B: Medical Condition You Are Requesting Be Added

Dementia is condition in which a person loses the ability to think, remember, learn, make decisions, and solve problems. Symptoms may also include personality changes and emotional problems. Dementia, including Alzheimer disease (AD), manifests as a profound loss of cognitive ability, with pronounced deficits in memory and executive function, and is often associated with behavioral changes. The syndromatic nature of dementia can be traced to its complex origins; the etiology of the disease remains incompletely understood and likely involves epigenetic, genetic, and environmental factors. Dementia usually gets worse over time. Although dementia is common in very elderly people, it is not part of normal aging.[1]

Further, Dementia is an acquired organic mental disorder with loss of intellectual abilities of sufficient severity to interfere with social or occupational functioning. The dysfunction is multifaceted and involves memory, behavior, personality, judgment, attention, spatial relations, language, abstract thought, and other executive functions. The intellectual decline is usually progressive.[1]

Section C: Symptoms of the Proposed Medical Condition and/or Its Treatment

Diagnostic Criteria and Symptomology
The DSM-5 criteria for major neurocognitive disorder, previously the DSM-IV criteria for dementia, is as follows:

A. Evidence of significant cognitive decline from a previous level of performance in one or more cognitive domains*:
   - Learning and memory
   - Language
   - Executive function
   - Complex attention

- Perceptual-motor
- Social cognition

B. The cognitive deficits interfere with independence in everyday activities. At a minimum, assistance should be required with complex instrumental activities of daily living, such as paying bills or managing medications.

C. The cognitive deficits do not occur exclusively in the context of a delirium.

D. The cognitive deficits are not better explained by another mental disorder (e.g., major depressive disorder, schizophrenia).

**Evidence of decline is based on: concern of the individual, a knowledgeable informant, or the clinician that there has been a significant decline in cognitive function; and a substantial impairment in cognitive performance, preferably documented by standardized neuropsychological testing or, in its absence, another quantified clinical assessment.*[2]

Although dementia isn't a specific disease, it describes a group of symptoms affecting memory, thinking and social abilities severely enough to interfere with daily functioning. Common signs and symptoms include cognitive changes: memory loss, difficulty communicating or finding words, difficulty reasoning or problem-solving, difficulty handling complex tasks, difficulty with planning and organizing, difficulty with coordination and motor functions, confusion and disorientation; and psychological changes: personality changes, depression, anxiety, inappropriate behavior, paranoia, agitation, hallucinations.[3]

Conventional Therapy Side Effects

According to Mayo Clinic, there is no cure for dementia, but medications are prescribed to mediate symptomology associated with dementia including: Cholinesterase inhibitors, memantine, medications to treat depression, sleep disturbances, or agitation. Palliative care therapies include: occupational therapy, environmental modification (tidiness/cleanliness), modifying tasks with structure and routine. Alternative therapies include: vitamin-E (low-evidence of efficacy), omega-3 fatty acids, and ginkgo (studies have been inconclusive with alternative therapies or dietary supplement for patients with dementia). Other therapies include music therapy, pet therapy, aromatherapy, massage therapy, and art therapy (all of which are utilized in redirection of expressed behavioral symptomology, along with routine therapy).[4]

- According to Mayo Clinic, common side effects of **Risperidone** include: aggressive behavior, agitation, anxiety, changes in vision, including blurred vision, difficulty concentrating, difficulty speaking or swallowing, inability to move the eyes, increase in amount of urine, loss of balance control, mask-like face, memory problems, muscle spasms of the face, neck, and back, problems with urination, restlessness or need to keep

moving (severe), shuffling walk, skin rash or itching, stiffness or weakness of the arms or legs, tic-like or twitching movements, trembling and shaking of the fingers and hands, trouble sleeping, and twisting body movements. Less common side effects include: back pain, chest pain, speech or vision problems, and sudden weakness or numbness in the face, arms, or legs. Rare side effects include: confusion, dizziness, drowsiness, extreme thirst, fast, shallow breathing, fast, weak heartbeat, headache, lip smacking or puckering, loss of appetite, muscle cramps, pale, clammy skin, poor coordination, prolonged, inappropriate and/or painful erections, puffing of the cheeks, fast or worm like movements of the tongue, shivering, talking, feeling, and acting with excitement and activity that cannot be controlled, uncontrolled chewing movements, uncontrolled twisting movements of the neck, trunk, arms, or legs, and unusual bleeding or bruising. Side effects that may be present as one's body adjusts to Risperidone include: constipation, cough, diarrhea, dry mouth, headache, heartburn, increased dream activity, prolonged sleep, sleepiness, nausea, sore throat, stuffy or runny nose, unusual weakness, weight gain, absent, missed or irregular menstruation periods, body aches or pain, breast swelling or soreness, chills, dandruff, darkening of skin color, decreased interest in sexual intercourse, dry skin, ear congestion, fever, impotence, increase in body movements, increase in watering of the mouth, joint pain, loss of voice, oily skin, facial pain, shortness of breath or trouble breathing, sneezing, stomach pain, tightness in the chest, toothache, unusual breast milk production, vomiting, and weight loss.[5]

- According to Mayo Clinic, side effects of **Olanzapine** include: bloating or swelling of the face, arms, hands, lower legs, or feet, blurred vision, change in vision, clumsiness or unsteadiness, difficulty speaking, slurred speech, difficulty swallowing, drooling, inability to sit still, mask-like face, muscle trembling, jerking, or stiffness, rapid weight gain or loss, slowed movements, stiffness of arms and legs, tic-like jerking in the head, face, mouth and neck, tingling of the hands and feet, tremors, and uncontrolled twisting movements of the body. Less common side effects include: bladder pain, bloody or cloudy urine, bruising, burning, crawling, itching, numbness, prickling, "pins and needles", or tingling feelings, chest pain, difficult or labored breathing, difficult, burning, or painful urination, dizziness, excessive muscle tone, frequent urge to urinate, headache, inability to move the eyes, increased blinking or spasms of the eyelid, itching of the vagina or genital area, lack of coordination, large, flat, blue, or purplish patches in the skin, loss of bladder control, loss of memory, lower back or side pain, muscle tension or tightness, nervousness, pain during sexual intercourse, pounding in the ears, problems with memory, rhythmic movement of the muscles, slow, fast, pounding, or irregular heartbeat or pulse, speaking is less clear than usual, sticking out the tongue, thick, white vaginal discharge with no odor or with a mild odor, tightness in the chest, twitching, uncontrolled twisting movements of the neck, trunk, arms, or legs, unusual or incomplete body or facial movements, and weakness of the arms and legs. Side effects that may go away as one's body adjusts to treatment include: acid or sour stomach, back pain, belching, change in personality, difficulty having a bowel movement (stool), discouragement, feeling sad or empty, fever, heartburn, increased appetite, increased cough, indigestion, lack of appetite, lack or loss of strength, loss of interest or pleasure, runny nose, sneezing,

stomach discomfort, upset, or pain, stuffy nose, thirst, trouble sleeping, trouble with concentrating, watering of the mouth, blemishes on the skin, body aches or pain, chills, cold sweats, congestion, cough, dry skin, dryness or soreness of the throat, false or unusual sense of well-being, heavy menstrual bleeding (periods), hoarseness, joint pain, lack of feeling or emotion, leg cramps, pain in the arms or legs, pimples, sweating, tender, swollen glands in the neck, uncaring feelings, voice change, and vomiting.[6]

- Per Mayo Clinic, common side effects of **Clozapine** include: blurred vision, confusion, dizziness, vertigo, fainting, fast, pounding, or irregular heartbeat or pulse, fever, shakiness in extremities, unusual sleepiness, sweating, trembling of hands or feet, and unusual weakness. Less common side effects include: anxiety, black, tarry stools, chest pain, chills, convulsions, cough, decrease frequency of urination, decrease in urine volume, trouble breathing, difficult in passing urine, discouragement, dry mouth, depression, fever, frequent or strong urge to urinate, fatigue, headache, hyperventilation, irritability, lack of appetite, loss of bladder control, apathy, lower back or side pain, muscle spasms, pounding in the ears, restlessness, slurred speech, sore throat, sores, ulcers, or white spots on the lips or in the mouth, sudden jerking movements of the body, fainting, swollen glands, trouble concentrating, insomnia, and issues with muscle control or coordination. Rare side effects include: absence or decrease in movement, change in appetite, dark urine, decreased sexual ability, difficult breathing, fast breaths or shortness of breath, increased sweating, increased thirst, increased urination, lip smacking or puckering, severe muscle stiffness, nausea, puffing of the cheeks, rapid or worm-like movements of the tongue, leg swelling or pain, uncontrolled chewing movements, uncontrolled movement of arms or legs, unusual bruising or bleeding, pale skin, vomiting, weakness, jaundice, abdominal pain, bloating, burning, crawling, itchiness, numbness, or tingling feelings, clay-colored stools, confusion, constipation, diarrhea, epileptic seizure that will not stop, paranoia, hallucinations, holding false beliefs that cannot be changed by fact, inability to move the eyes, eyelid spasms, indigestion, itching or skin rash, joint pain, muscle twitching, severe mood or mental changes, sticking out of the tongue, swelling, trouble speaking, bad breathe, unusual behavior, unusual facial expressions, unusual weight gain, upper right abdominal pain, and vomiting blood. Side effects that may go away as one's body adjusts to the medicine include: acid or sour stomach, belching, feeling of constant movement of self or surroundings, heartburn, relaxed and calm sensation of spinning, sleepiness, blurred or loss of vision, change or problem with semen discharge, disturbed color perception, double vision, halos around lights, inability to sit still, muscle ache or pain, muscle weakness, night blindness, nightmares, light sensitivity, bodily pain, shortness of breath, sore tongue, stuffy nose, tunnel vision, fatigue, blistering, peeling or loosening of the skin, hives, painful or prolonged erection, red skin lesions often with purple center, red, irritated eyes, reddening of the skin – especially around the ears, severe stomach pain, severe sunburn, sores, welting, or blisters, swelling of the eyes, face, or inside of the nose, and swelling of the salivary glands.[7]

- According to Mayo Clinic, **Donepezil** (cholinesterase inhibitor) side effects include: diarrhea, loss of appetite, muscle cramps, nausea, trouble in sleeping, unusual tiredness or weakness, and vomiting. Less common side effects include: abnormal dreams, constipation, dizziness, drowsiness, fainting, frequent urination, headache, joint pain, stiffness, or swelling, mental depression, pain, unusual bleeding or bruising, and weight loss. Rare side effects include: black, tarry stools, Bloating, bloody or cloudy urine, blurred vision, burning, prickling, or tingling sensations, cataract, chills, clumsiness or unsteadiness, confusion, cough, decreased urination, difficult or painful urination, dryness of mouth, eye irritation, fever, flushing of skin, frequent urge to urinate, high or low blood pressure, hives, hot flashes, increase in sexual desire or performance, increased heart rate and breathing, increased sweating, increased urge to urinate during the night, irregular heartbeat, itching, loss of bladder control, loss of bowel control, mood or mental changes, including abnormal crying, aggression, agitation, delusions, irritability, nervousness, or restlessness, nasal congestion, pain in chest, upper stomach, or throat, problems with speech, runny nose, severe thirst, shortness of breath, sneezing, sore throat, sunken eyes, tightness in chest, tremor, troubled breathing, wheezing, and wrinkled skin.[8] Drugs in the same class with similar side effects include: **Galantamine**[9] and **Rivastigmine**[10].

- According to Mayo Clinic, **Memantine** is used to treat symptoms of Alzheimer's disease, and may help with mild to moderate vascular dementia. Side effects of Memantine include: Bloating or swelling of the face, arms, hands, lower legs, or feet, blurred vision, dizziness, headache, nervousness, pounding in the ears, rapid weight gain, slow or fast heartbeat, tingling of the hands or feet, and unusual weight gain or loss. Rare side effects include: abdominal or stomach pain, agitation, black, tarry stools, bleeding gums, blistering, peeling, or loosening of the skin, blood in the urine or stools, chest pain, coma, constipation, continuing vomiting, convulsions, dark-colored urine, decreased urine output, depression, fainting, fast, pounding, or irregular heartbeat or pulse, general feeling of tiredness or weakness, high fever, high or low blood pressure, hostility, increased sweating, indigestion, infection from breathing foreign substances into the lungs, itching, lethargy, light-colored stools, lip smacking or puckering, loss of consciousness, muscle twitching, no blood pressure, no breathing, no pulse, numbness or tingling in the face, arms, or legs, pain in the stomach, side, or abdomen, possibly radiating to the back, pain or swelling in the arms or legs without any injury, pain, tension, and weakness upon walking that subsides during periods of rest, pinpoint red spots on the skin, pounding, slow heartbeat, puffing of the cheeks, rapid or worm-like movements of the tongue, rapid weight gain, recurrent fainting, red irritated eyes, red skin lesions, often with a purple center, seizures, severe constipation, severe headache, severe muscle stiffness, severe vomiting, sores, ulcers, or white spots in the mouth or on the lips, stupor, sudden severe weakness, swelling of the face, ankles, or hands, total body jerking, trouble with speaking or walking, troubled breathing, twitching, twisting, or uncontrolled repetitive movements of the tongue, lips, face, arms, or legs, uncontrolled chewing movements, unusual bleeding or bruising, unusually pale skin, vomiting, and jaundice.[11]

- Antidepressants may be used to treat depression in patients with dementia; they include **Amitriptyline,**[12] **Wellbutrin,**[13] **Celexa,**[14] **Prozac**[15]**, Zoloft,**[16] and **Effexor.** Side effects of said drugs are similar and, according to Mayo Clinic, may include: More common: anxiety, high blood pressure, lack or loss of strength, severe headache, sweating. Less common: blurred vision, chest pain, fast or irregular heartbeat, mood or mental changes, ringing or buzzing in the ears, and suicidal thoughts. Rare: actions that are out of control, convulsions, high fever, high or low blood pressure, irritability, itching or skin rash, lightheadedness or fainting, especially when getting up suddenly from a sitting or lying position, menstrual changes, nervousness, problems with urinating or holding urine, severe muscle stiffness, talking, feeling, and acting with excitement that you cannot control, trouble breathing, and unusually pale skin, agitation, bloody, black, or tarry stools, bloody stool or urine, confusion, dark urine, decreased frequency or amount of urine, diarrhea, drowsiness, fever, general feeling of tiredness or weakness, headache, increased thirst, light-colored stools, muscle cramps, spasms, or pain, nausea or vomiting, nosebleeds, overactive reflexes, poor coordination, red or purple spots on skin, restlessness, shivering, stomach pain on upper right side, swelling of the face, lower legs, ankles, hands, or fingers, trembling or shaking that is hard to control, twitching, unusual bruising, unusual tiredness or weakness, vomiting of blood or material that looks like coffee grounds, and jaundice. Side effects that may decrease as the patient's body adjusts to the medication include: More common: abnormal dreams, chills, constipation, decrease in sexual desire or ability, diarrhea, drowsiness, dry mouth, heartburn, increased sweating, loss of appetite, nausea, stomach pain or gas, stuffy or runny nose, tingling, burning, or prickly sensations, trembling or shaking, trouble sleeping, unusual tiredness or weakness, vomiting, and weight loss. Less common: change in taste, muscle tension, and yawning. Rare: Night sweats.[17]

- According to Mayo Clinic, **Trazadone** side effects include: More common: blurred vision, confusion, dizziness, dizziness, faintness, or lightheadedness when getting up suddenly from a lying or sitting position, lightheadedness, sweating, and unusual tiredness or weakness. Less common: burning, crawling, itching, numbness, prickling, "pins and needles", or tingling feelings, confusion about identity, place, and time, decreased concentration, fainting, general feeling of discomfort or illness, headache, lack of coordination, muscle tremors, nervousness, pounding in the ears, shortness of breath, slow or fast heartbeat, and swelling. Rare: skin rash, and unusual excitement.[18]

- Anxiolytics may be prescribed to treat symptoms of anxiety and behavior disorder. Drugs in this class have similar side effects and risk for overdose. According to Mayo Clinic, side effects of **Lorazepam** include: More common: drowsiness, relaxed and calm, sleepiness. Incidence not known: Abdominal or stomach pain, aggressive, angry, agitation, attack, assault, or force, black, tarry stools, bleeding gums, blood in the urine or stools, bluish lips or skin, blurred vision, change in consciousness, chills, coma, confusion, confusion about identity, place, and time, convulsions, cough or hoarseness, dark urine, decreased urine output, difficulty with breathing or swallowing, difficulty with speaking, discouragement, dizziness, faintness, or lightheadedness when getting up suddenly from a lying or sitting

position, drooling, dry mouth, excitation, false or unusual sense of well-being, fast or irregular heartbeat, feeling sad or empty, fever with or without chills, general feeling of tiredness or weakness, headache, hives, itching, or rash, hyperventilation, increased thirst, irregular, fast or slow, or shallow breathing, irritability, loss of appetite, loss of balance control, loss of consciousness, loss of interest or pleasure, loss of memory, lower back or side pain, muscle pain or cramps, muscle trembling, jerking, or stiffness, nausea or vomiting, not breathing, painful or difficult urination, pale or blue lips, fingernails, or skin. pinpoint red spots on the skin, problems with memory, puffiness or swelling of the eyelids or around the eyes, face, lips, or tongue, reddening of the skin, especially around ears, restlessness, seeing, hearing, or feeling things that are not there, seizures, shaking, shuffling walk, sore throat. sores, ulcers, or white spots on the lips or in the mouth, stiffness of the limbs, sweating, swelling of the eyes or inside of the nose, swelling of the face, ankles, or hands, swollen glands, thoughts or attempts at killing oneself, tightness in the chest, trouble concentrating, trouble sleeping, twisting movements of body, uncontrolled movements, especially of the face, neck, and back, unexplained bleeding or bruising, unpleasant breath odor, unusual bleeding or bruising, unusual tiredness or weakness, vomiting of blood, jaundice. Some side effects may diminish as the patient's body adjust to the medicine; including: being forgetful, Clumsiness, constipation, decreased interest in sexual intercourse, disturbed color perception, dizziness or lightheadedness, double vision, drowsiness, feeling of constant movement of self or surroundings, hair loss or thinning of the hair, halos around lights, inability to have or keep an erection, increased in sexual ability, desire, drive, or performance, increased interest in sexual intercourse, lack or loss of self-control, lethargy, loss in sexual ability, desire, drive, or performance, muscle aches, twitching, or weakness, night blindness, over-bright appearance of lights, rapid weight gain, sensation of spinning, shakiness in the legs, arms, hands, or feet, shivering, stupor, trembling or shaking of the hands or feet, tunnel vision, and weak or feeble pulse. Overdose is possible and symptoms include: changes in patterns and rhythms of speech, increased sweating, loss of strength or energy, nightmares, shakiness and unsteady walk, slurred speech, trouble speaking. unsteadiness, trembling, or other problems with muscle control or coordination, unusual drowsiness, dullness, tiredness, weakness, or feeling of sluggishness, unusual excitement, nervousness, restlessness, or irritability, unusual paleness, and unusual weak feeling.[19]

- According to Mayo Clinic, side effects of **Ziprasidone** include: Most common: cough, difficulty with speaking, drooling, fear or nervousness, fever, inability to sit still, loss of balance control, muscle trembling, jerking, or stiffness, need to keep moving, restlessness, shuffling walk, sneezing, sore throat, stiffness of the limbs, twisting movements of the body, and uncontrolled movements, especially of the face, neck, and back. Less common: blurred vision, body aches or pain, chest pain, congestion, dizziness, fast, pounding, or irregular heartbeat or pulse, headache, hoarseness, pounding in the ears, runny nose, slow or fast heartbeat, swelling of the tongue, tender, swollen glands in the neck, trouble with swallowing, and voice changes. Rare: dizziness, faintness, or lightheadedness when getting up suddenly from a lying or sitting position, persistent, painful erection, seizures. Incidence not known: inability to move the eyes, increased blinking or spasms of the

eyelid, sticking out of tongue, trouble with breathing, uncontrolled twisting movements of the neck, trunk, arms, or legs, and unusual facial expressions.[20]

Section D: Availability of Conventional Medical Therapies

Dementia does not have a cure and treatments are centered around managing the symptoms associated with the illness.[3]

Medication Therapies

Medication therapies for dementia include:

- Cholinesterase inhibitors such as donepezil (Aricept), rivastigmine (Exelon) and galantamine (Razadyne) boost levels of a chemical messenger involved in memory and judgement. These medications are primarily used to treat Alzheimer's disease, but may also be used to treat other forms of dementia such as vascular dementia, Parkinson's disease dementia, and Lewy body dementia.[3]

- Memantime (Namenda) works by regulating the activity of glutamate, another chemical messenger involved In brain functions such as learning and memory. This may be prescribed in conjunction with a cholinesterase inhibitor.[3]

- Namzaric is a medication that combines donepezil with memantine.[3]
- Other medications may be prescribed for depression, sleep disturbances, and agitation.[3]

Treatments for the behavioral symptoms of dementia include antidepressants such as citalopram, fluoxetine, paroxetine, sertraline, and trazadone for the treatment of low mood and irritability; anxiolytics such as lorazepam and oxazepam for the treatment of anxiety, restlessness, verbally disruptive behavior, and resistance; and antipsychotic medications such as aripiprazole, clozapine, haloperidol, olanzapine, quetiapine, risperidone, and ziprasidone for hallucinations, delusions, aggression, agitation, hostility, and uncooperativeness.[3]

Non-Drug Therapies

Individuals exhibiting signs and symptoms of dementia may be initially treated with non-drug interventions such as occupational therapy, environmental modification, and task modifications. Occupational therapy includes creating a safer home and teaching coping skills to present accidents, manage behavior, and prepare the patient for dementia progression. Environmental modifications include reducing clutter and noise to make it easier for the patient to focus and function, hiding objects that can threaten safety, and installing monitoring systems that alert a caregiver if the patient wanders.[3]

Alternative Medicine and Supplements

Some dietary supplements, herbal remedies and therapies may be beneficial for dementia patients. Alternative medicines may include Vitamin E which has shown evidence of slowing Alzheimer's disease, Omega-3 fatty acids which may reduce the risk of dementia, and Ginko which may help people with dementia although the study results have been inconsistent.[3]

Other techniques to reduce agitation and promote relaxation include music therapy, pet therapy, aromatherapy, massage therapy, and art therapy.[3]

Section E: Anticipated Benefits from Medical Cannabis

Terpenoids as Potential Anti-Alzheimer's Disease Therapeutics
This study investigated naturally occurring terpenoids and cannabinoids as anti-Alzheimer's Disease (AD) medication. Tetrahydrocannabinol is a widely-studied natural product with anti-emetic, anti-convulsive, anti-inflammatory, and analgesic effects. A protective effect of THC against AD has been reported. THC comparatively inhibits AChE and creases the availability of Ach. It also reduces the inhibition of AChE-induced Aß aggregation, and subsequently reduces Aß-induced toxicity. It is more efficient than commercially available AChE inhibitors such as tacrine and donepezil, and reduced behavioral and circadian disturbances in patients with severe dementia. Further, cannabidiol has neuroprotective effects against AD. The strong antioxidant effects of CBD provide neuroprotection by reducing oxidative damage such as lipid peroxidation. CBD also alleviates Aß-induced inflammatory signals. Further, Tau hyperphosphorylation, a pathological hallmark of AD, is also reduced by CBD treatment. The neuroprotective effects of CBD have been confirmed in an AD-mouse model induced with intrahippocampal injection of Aß by a reduction in glial activated pro-inflammatory mediators[21]

The Role of the Endocannabinoid System in Alzheimer's Disease Facts and Hypotheses
This research looked at various literature on the regulation and role of the endocannabinoid system in Alzheimer's disease, and the potential treatment of this disorder with cannabinoids and endocannabinoid-based drugs. The data review concluded that direct antagonists against the CB1 and CB2 receptors could prove beneficial for use in AD patients, but that indirect agonists might be as efficacious as, and safer than the direct antagonists. Additionally, endocannabinoids appear to also contribute to the cognitive symptoms of Aß-induced neurotoxicity and might be useful in late phases of the disorder to reduce the cognitive deficits of AD. Non-cannabinoid receptor-mediated mechanisms induced by the anti-inflammatory components of cannabis, for cannabidiol, might also be exploited in the future as relatively safe therapeutic strategies.[22]

The Potential Therapeutic Effects of THC on Alzheimer's Disease
This study investigated the potential therapeutic qualities of tetrahydrocannabinol with respect to slowing or halting characteristics of Alzheimer's disease. N2a-variant amyloid-ß protein precursor cells (AßPP) were incubated with THC and assayed for amyloid-ß levels at the 6, 24, and 48-hour time marks. Further testing was done on THC synergy with caffeine, which is not discussed in this summary. The study shows the proclivity to slow or halt Alzheimer's disease progression by dampening the synthesis of the major pathological marker of AD, Aß, at an

extremely low dose of THC. The authors conclude that the multifaceted functions of THC will ultimately decrease downstream tau hyperphosphorylation and neuronal death, thereby halting or slowing the progression of Alzheimer's disease.[23]

Safety and Efficacy of Medical Cannabis Oil for Behavioral and Psychological Symptoms of Dementia: An-Open Label, Add-On, Pilot Study

A study from Israel examined whether tetrahydrocannabinol (THC) is an effective treatment for Alzheimer's disease as an add-on to the patient's current pharmacotherapy, in relieving behavioral and psychological symptoms associated with dementia (BPSD). The researchers observed and treated eleven patients with Alzheimer's disease (who suffered from BPSD) for four weeks on an open label trial. The researchers note that many studies have indicated that THC directly interacts with amyloid-ß peptide – a group of amino acids that are crucially involved in Alzheimer's disease as the main component of the amyloid plaques found in the brains of Alzheimer patients – associating the endocannabinoid systems involvement on neuroinflammation, neurogenesis, and the pathological processes of Alzheimer's disease. The researchers note that the endogenous cannabinoid system is involved with the central nervous system with regulation of psychomotor activation, mood, sleep-wake cycle, and eating behavior – all said functions are impaired in moderate and severe dementia. Eleven inpatients were recruited during February 2013 – July 2014, with their diagnosis' in accordance with DSM-IV criteria for Alzheimer's dementia accompanied by BPSD. A form of botanical cannabis (MCO) was utilized for the study. MCO is an oil extract from cannabis flowers with a 1.65% potency. MCO of 2.5mg of THC was added to the patients' medication regime (mainly antipsychotic medications). If no adverse side-effects or any minor improvements were noticed after two days, the patients received an increased dosage to 5 mg of THC (as MCO) twice daily. The maximal dosage a patient received during the four-week study was 7.5 mg THC twice daily, with the minimal dose being 2.5 mg. During the four weeks, patients' weight, glucose level, and both systolic and diastolic blood pressure were assessed. Ten patients completed the full trial. Eight patients' medication regime included antipsychotic medications: 5-Risperidone, 2-Olanzapine, and 1-Clozapine; four patients received acetylcholinesterase inhibitors – used to relieve neurological symptoms of dementia. Three patients suffered adverse events, two not associated with MCO ingestion, with the third patient reducing to the minimal dosage of 2.5 mg/day – and the patient's adverse side-effect of confusion improved. Results of the study indicate that no significant changes were obtained for weight, glucose level, and both systolic and diastolic blood pressure. The researchers concluded that significant decreases in symptomology were observed in delusions, agitation/aggression, apathy, irritability, aberrant motor behavior, sleep and night time behavior disorders, and Caregiver distress was reduced. The researchers state that "there is no FDA-approved treatment for BPSD, but antipsychotic drugs are frequently prescribed off-label yielding only modest improvements associated with increased mortality."[24]

A Molecular Link between the Active Component of Marijuana and Alzheimer's Disease Pathology

A study from California in 2006, demonstrated that the active component of marijuana, Δ9-tetrahydrocannabinol (THC), competitively inhibits the enzyme acetylcholinesterase (AChE) as

well as prevents AChE-induced amyloid â-peptide (Aß) aggregation (plaque formation in the brain) - the key pathological marker of Alzheimer's disease – in mice models, with control experiment results that were identical to those used to assay Aß aggregation (plaque formation). Through the study, the researchers found that THC shows competitive inhibition of AChE, and completely blocks the AChE effect on Aß aggregation – one of the most effective aggregation inhibitors reported to date. The researchers state that "it is noteworthy that THC is a considerably more effective inhibitor of AChE-induced Aß deposition than the approved drugs for Alzheimer's disease treatment, donepezil and tacrine;"[25] therefore, THC and other cannabinoids may provide therapeutic benefits for dementia by preventing neurotransmitter degradation and reducing Aß aggregation, thereby simultaneously treating both the symptoms of dementia and progression of Alzheimer's disease.[25]

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Alzheimer's Disease; Taking the Edge Off with Cannabinoids?

A review by scientists from the Department of Physiology and Trinity College Institute of Neuroscience, Trinity College Dublin, in Ireland investigated the known pathological hallmarks of Alzheimer's disease, which include: the deposition of ß-amyloid protein and hyper-phosphorylation of tau – evoking neuronal cell death and impairing inter-neuronal communication, neuroinflammation, excitotoxicity, and oxidative stress. The scientists investigate the proclivity of cannabinoids ability to exert a neuroprotective influence, and the mitigation of the symptoms of neurodegenerative disease (such as dementia). The scientists state that neuronal damage increases the production of endocannabinoids – implementing cannabis use as protection against deleterious consequences of pathogenic molecules such as amyloid-ß peptides (Aß). Aß has been shown to induce hippocampal degeneration, gliosis, and cognitive declined. It is surmised that cannabis can reverse the negative consequences of exposure to Aß based on research conducted on rodents. Cannabidiol (CBD) has been shown to prevent Aß-mediated neurotoxicity (neuronal cell death), reverse tau hyper-phosphorylation by reducing phosphorylation of glycogen synthase kinase-3B – a tau protein kinase responsible for hyper-phosphorylation in Alzheimer's disease, oxidative stress, neuro-inflammation, and apoptosis (a process of programmed cell death). In several mouse models of Alzheimer's disease, neurogenesis is reduced – targeting adult neurogenesis is a means to mitigate the symptoms of Alzheimer's disease. Cannabis has been shown to regulate neurogenesis in the dentate gyrus of the hippocampus and the subventricular zone of the brain – resulting in the presence of newly generated neurons in the adult brain. In conclusion, the authors state that "Alzheimer's disease is a devastating illness for which there is no cure. Current AD drugs, which serve as AChE inhibitors, have several unpleasant side effects such as hepato-toxicity and gastrointestinal disturbances."[26] The process of neurodegeneration cannot be reversed with

current treatments. It's surmised that cannabinoids can reduce oxidative stress, neuroinflammation, and apoptosis – while promoting the brain's essential repair mechanisms.[26]

The Therapeutic Potential of the Endocannabinoid System for Alzheimer's Disease

Karl et al. 2013 explore the endocannabinoid system in relation to Alzheimer's disease. In particular, their analysis suggests that the endocannabinoid system is implicated in anti-inflammatory, neuroprotective, and antioxidant processes, and have immunosuppressive effects. The authors' expert opinion outlines the lack of currently available treatments to stop or reverse progression of AD, and mention that no novel treatments have been approved since memantine in 2003. Therapeutic targeting of the endocannabinoid system may offer protection from pathological processes found in AD. Further, endocannabinoids, particularly of note, cannabidiol, appear to have the capacity to provide balanced immune-modulation, beneficial for AD therapy.[27]

Clinical Pharmocology of Oral THC in the Elderly with Dementia

This comprehensive doctoral thesis by Amir Isam Ali Ahmed is a thorough evaluation of the use of medical cannabinoids for patients with dementia. In evaluating both *in vitro* and *in vivo* studies, Ahmed notes that several studies have demonstrated that targeting the endocannabinoid systems offers a novel pharmacological approach to the treatment of late-onset Alzheimer's disease. This approach may be more effective than currently available treatments. According to Ahmed, all published studies, to date of the thesis publication, have shown that THC is effective in the treatment of dementia related symptoms such as behavioral disturbances, loss of appetite, and sleep problems. He notes that these studies were not randomized controlled trials or included a small number of participants. Further, Ahmed conducted a phase 1 clinical trial of THC-based medicine Namisol® in healthy individuals aged 65 and older. The study found that oral dosing of THC up to 6.5 mg/day was safe and well-tolerated by the participants. Further, phase 2 studies explored by Ahmed involving older people with dementia showed doses of oral THC up to 4.5 mg/day was well tolerated. Finally, Ahmed discussed the use of THC for pain in patients with dementia, finding THC as a potential multi-target drug candidate, with a promising pharmacodynamics profile, for dementia patients with chronic pain.[28]

Delta-9-tetrahydrocannabinol for Nighttime Agitation in Severe Dementia

The study measured the effect of the cannabinoid dronabinol on nocturnal motor activity using six consecutive patients in the late stages of dementia suffering from circadian and behavioral disturbances; five patients with Alzheimer's disease and one with vascular dementia. Many patients with dementia, especially in late stages, suffer from day-night rhythm disturbances, which can be one of the most difficult symptoms for family and professional caregivers to deal with. The patients were treated with 2.5 mg/day of dronabinol for two weeks. This lead to a reduction in nocturnal motor activity, improvements in Neuropsychiatric Inventory scores, as

well as subscores for agitation, aberrant motor, and nighttime behaviors. Additionally, no adverse events occurred during the study.[29]

Cannabinoids in Neurodegenterative Disorders and Stroke/Brain Trauma: From Preclinical Models to Clinical Applications

This review collects the preclinical evidence generated in the last from 2000-2015 that supports the need to develop cannabinoid-based therapies for the treatment disease progression in neurodegenerative disorders, including Alzheimer's disease. Cannabinoids have attracted interest in AD given benefits in reducing neurotoxic events in the disease in pre-clinical studies, such as excessive glutamatergic transmission, prolonged calcium influx, oxidative stress, and inflammation. Preclinical studies showing beneficial effects involved CB1 and CB2 receptors, the selective activation of these receptors, and the prevention of Aß-induced microglial activation and the generation of pro-inflammatory mediators. Additional beneficial effects include removing pathological deposits in different *in vivo* and *in vitro* models of AD. Some particular cannabinoids may exert more specific effects in relation to AD pathogenesis by preventing Aß aggregation, thereby hindering plaque formation and reducing the density of neuritic plaques, and by inhibiting Aß-induced tau protein hyperphosphorylation by glycogen synthase kinase-3ß. Clinical development of cannabinoid therapies for AD are limited, and the few clinical studies have concentrated on specific symptoms rather than modification of the disease. However, given the effects in pre-clinical research, cannabinoids could become a promising novel disease-modifying therapy for patients with AD.[30]

Clinical Evidence for Utilizing Cannabinoids in the Elderly

A study from 2017 in Israel examined clinical evidence suggesting the potential for utilizing cannabis as a safe and effective therapy for the geriatric population. The authors claim that to date, there are two known cannabinoid receptor subtypes (CB1 and CB2). The two receptors differ from each other in binding eristically – indicating that the whole cannabis is more effective than a single ingredient due to cannabinoids interacting synergistically with each other in a body – leading to the understanding of "the entourage effect." The authors discuss cannabinoids and Parkinson's disease (PD) as well as Dementia. It is suggested that current preclinical and clinical data indicates therapeutic potential for patients with PD by targeting the endocannabinoid system (eCB) and modulating the dopaminergic transmission in the basal ganglia – suggesting that selective pharmacological intervention in the eCB signaling pathway may have a beneficial effect in motor and non-motor symptoms of PD. The authors note that dementia is a clinical mental syndrome affecting older adults. Changes of the eCB system in Alzheimer's disease (the most current leading indicator of dementia) happen in two locations of the brain: the hippocampus and the cerebral cortex. In dementia, there is an increase in FAAH enzyme activity and levels in astrocytes associated with neuritic plaque; elevated 2-AG levels linked to β-amyloid hippocampal degradation, apparently in an independent manner due to FAAH increase; CB2 up-regulation in microglial cells adjacent to β-amyloid plaques; and reduction in the number of CB1-positive neurons. The authors mention a placebo-controlled crossover-designed study (cited 16, in journal) were first in demonstrating the amelioration in

behavioral disturbance in patients living with dementia, following treatment of a THC analogue – dronabinol. While both preclinical and clinical data suggests a therapeutic potential of cannabinoids for patients with dementia, clinical data has shown more benefits in treating behavioral, agitation, and other neuropsychiatric symptoms associated with dementia. The authors understand that cannabinoids are efficient and safe therapies to manage behavioral disturbances in patients with dementia. Changes in sleep patterns and quality of sleep is considered a natural process of ageing, with poor sleep being associated with impairment in quality of life – affecting an elderly person's health more negatively in cognitive decline than in a younger person's health. It's stated that short sleepers with poor quality of sleep were found to have a 63% higher risk of developing cardiovascular disease. Patients with dementia may suffer with disruptive sleep cycles, insomnia, or negative behavioral responses due to the change from day to night. Current treatments include benzodiazepines, non-benzodiazepines, and melatonin which may endanger patients due to various adverse effects of pharmacological treatments. That authors note that research (cited 23, in journal) have concluded that medicinal cannabis use reduces sleep disturbances and improves quality of sleep without affecting sleep duration. A study is mentioned (cited 18, in journal) that night-time agitation of six patients suffering from severe dementia showed that THC led to a significant reduction in nocturnal motor activity as well as an improvement in neuropsychiatric symptomology. No adverse effects were reported in elderly patients based from six different studies compromising a total of 260 elderly patients (cited 35, in journal), and concluded that sedation/drowsiness was the most frequent complaint among patients. The authors mention a recent randomized, placebo-controlled cross-over study that examined THC's side effect of drowsiness on balance and gait in patients with dementia (cited 38, in journal). Patients with dementia were treated with THC for three days and measured for balance and gait performance two hours after treatment. It was found that THC exposure increased stride length and trunk sway during patients' preferred speed walking and increased sway while standing with eyes closed. During dual-task walking or standing with eyes open, no effects were observed. There were zero cases of falls during the study, implying the relative safety of THC therapy. It's concluded that medicinal cannabis in dementia is a safe option for treating behavioral problems, with evidence suggesting potential for alleviating sleep disturbances and weight loss in the elderly. Cannabis has been shown to be a safe and effective therapeutic tool in elderly care, particularly in patients suffering from dementia or PD.[31]

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In conclusion:

Multiple studies have indicated the therapeutic properties of cannabis in slowing the progression of neurodegenerative disease (dementia), healing brain damage by increasing neurogenesis, reducing oxidative stress and neuroinflammation, as well as treating symptomology of dementia including: cognitive decline, delusions, agitation/aggression,

apathy, irritability, aberrant motor behavior, sleep and night time behavior disorders, eating disorders, and caregiver distress. The endocannabinoid system has been shown to be a mechanism involved in ameliorating neurodegenerative processes via CB1 and CB2 receptors. Adding the receptor antagonist CBD, along with the agonist THC, have separately been shown to be alleviate symptoms of dementia. Cannabis has been shown to not interfere with a patient's current pharmacotherapy regime. Cannabis has the potential to relieve many side effects of patients' regime of medications. It is recommended that dementia, including Alzheimer's disease, be added to Minnesota's Medical Cannabis Program as a qualifying condition.

Section F: Scientific Evidence of Support for Medical Cannabis Treatment

The following scientific literature is enclosed:

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Katz, I., Katz, D., Shoenfeld, Y., MD, & Porat-Katz, B., MD. (2017). Clinical evidence for utilizing cannabinoids in the elderly. *Israel Medical Association Journal, 19*, 71-75. PMID: 28457053.
Shelaf, A., Barak, Y., Berger, U., Paleacu, D., Tadger, S., Plopsky, I., & Baruch, Y. 2016. Safety and efficacy of medical cannabis oil for behavioral and psychological symptoms of dementia: an-

open label, add-on, pilot study. Journal of Alzheimer's Disease, (51), 15-19. DOI: 10.3233/JAD-150915.

Walther, S., Mahlberg, R., Eichmann, U., & Kunz, D. (2006). Delta-9-tetrahydrocannabinol for nighttime agitation in severe dementia. *Psychopharmacology,185*(4), 524-528. doi:10.1007/s00213-006-0343-1

Yoo, K., Park, S. 2012. Terpenoids as potential anti-Alzheimer's disease therapeutics. Molecules. DOI: 10.3390.

Section G: Letters in Support of Adding the Medical Condition

A letter of support is included from Dr. Jacob Mirman.

Additionally, the following individuals indicated their support for the addition of Liver Disease as a qualifying condition to Sensible Minnesota and Marijuana Policy Project. Commentary is as sent, except for minor modifications for clarity.

[redacted]
Physician
[redacted]

Patients that need marijuana for their conditions face many difficulties obtaining it. This is unfair and hurts patients.

[redacted]
Physician, Patient's Spouse
[redacted]

[redacted]
Physician Assistant, Personal Care Assistant
[redacted]

I work in multiple homes with high and frequent behaviors from individuals that suffer from these conditions. Some are nonverbal and some that can't go to the bathroom on their own because they forgot how to. They injure themselves and other clients and staff and they don't even know why. I believe marijuana would help bring peace to many individuals on much more intense medicine with much worse side effects.

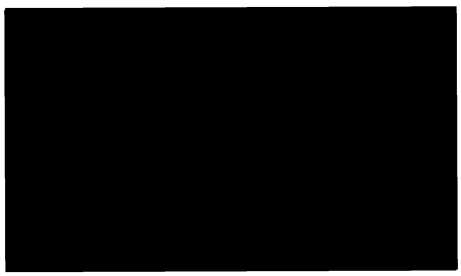
[redacted]

[redacted]

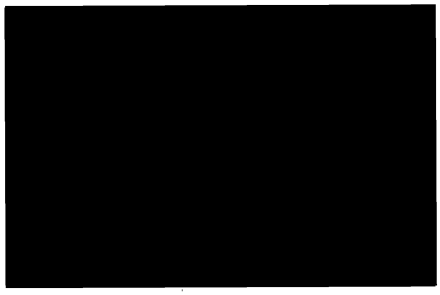
I have wide spread chronic pain (fibromyalgia, myofascial, muscle spasms, nerve pain, migraines) well as nausea from Mariners disease. I also have issues with anxiety, depression & PTSD. I've just started the medical cannabis program here about 1mo ago. I've noticed a major decrease in my nausea & anxiety I'm not as depressed my muscle spasms have lessened and I don't concentrate a lot on the pain but the pain is still there. I do not feel sick or lethargic like I did when I was on opiate medication. For the first time in 20 plus years I can sleep 4+ hrs. @ night. I've also noticed that I'm able to focus a better without all the anxiety of having to remember how to move and how to be around people in public. The major drawback to this program here in Minnesota for me is that I'm low-income and have a hard time paying for the products. I would also like to see other choices such as edibles or the plant as an option. In conclusion, I would like to add that this medication would be fabulous for all the related conditions above especially for people with Alzheimer's and Dementia to alleviate their stress of anxiety when they can't remember or become disoriented. As well as for people with autism will help with their focus and minimize the cold symptoms of anxiety and depression. Thank you for your time

[redacted]

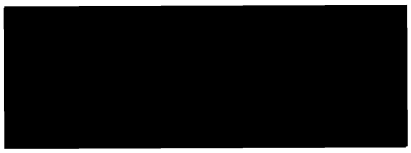
I'm on the medical program for chronic pain here in Minnesota. And marijuana works best for everything without the harsh side effects that pharmaceuticals. But this program is lacking quality, variety, and the range of conditions! If someone has an ailment and marijuana helps them best, why should there be any question who gets treatment? When its so easy for people to get opiates and Vicodin and Percocet that kill 10's of thousands a year and this natural, broad range of multiple reliefs, with extremely limited side effects, and 0 deaths ever is so hard to get! It's stupid and ridiculous that we're even still having to fight and beg for something today is so much better than anything that big Pharma and doctors are tying to do for us!



My chronic pain and nausea caused by migraine headaches and lower back issues are relieved by medical marijuana. Opiates are not an option in my life as I am allergic.



I have personal experience in managing chronic pain and nausea though the CBD edibles my sister has shared with me while visiting her in California, where she has a medical card and uses these regularly to manage her symptoms. I have never experienced any problematic side effects, and she specifically takes the CBD edibles and tinctures as an alternative to many other pharmaceuticals that she HAS had terrible side effects with. She currently uses medical marijuana to treat the symptoms of Lupus, Ischemic Colitis, Chronic Fatigue and Fibromyalgia, as well as depression, nausea, anxiety and chronic pain from the above diseases. I believe the above conditions that include those being petitions for addition in Minnesota would greatly assist those dealing with these chronic diseases to get some relief without the terrible side effects from pharmaceuticals. My mother is experiencing dementia and liver disease because of long-term alcohol use and I would like to see the state offer her an alternative, healthier form of support for symptoms of these diseases as well.



[redacted]

I would like to lawfully try Cannabis for my husband who has Alzheimer's. He is 85 years old and I do not believe there is much chance of drug misuse; I administer all his medications. I do not believe medical cannabis is any different than other drugs which the pharmaceutical companies invent and is probably less harmful because it is a natural substance, not one created.

I hope to soon be able to get medical cannabis from the VA where my husband receives all his medical treatment.

People will get this product wherever they can find it, at the most reasonable price. Minnesota needs to approve and regulate this product.

Thank you for your efforts.

[redacted]

[redacted]

As a patient, I feel as though anyone who can be helped by Medical Marijuana should have the option to try to find a medicine that can help with their condition.

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07-20-2017

Minnesota Department of Health Office of Medical Cannabis
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To the Minnesota Department of Health,

My name is Dr. Jacob Mirman, I graduated from the University of Minnesota Medical School and completed my residency in primary care internal medicine at Illinois Masonic Medical Center in Chicago. I specialize in integrative medicine and I am the Medical Director of Life Medical, an integrative medicine clinic in St. Louis Park.

I write to you today in support of the petitions to add nausea, autism, dementia, Alzheimer's disease, liver disease, and chronic pain to Minnesota medical cannabis program. As a physician treating patients for all these conditions, I believe my patients who suffer from these conditions would benefit from being added to the state's program.

I am a primary care internist. I am a not a politician, a law enforcement officer or a cannabis policy expert. Yet, as an internist with 25 years of experience working with patients, I hope you will consider my views on whether to expand Minnesota's medical cannabis program.

I have been certifying patients for medical cannabis for over a year now, and have seen a tremendous benefit to patients when they return to me for follow-ups. Notably, in addition to the medical condition that qualifies them for the program, many patients who I have certified suffer from some other ailment — including several listed above — and have seen their conditions improved with medical cannabis use.

Patients come to me because they need help. I agree to see them and do my best to help them. The buck stops with me. If I send a patient to a specialist and he or she is unable to help, the patient comes back to me and their medical care is again my responsibility.. When standard approaches do not help the patient, my responsibility as their physician does not end.

For the last few months, around 20% of my practice has involved treating patients benefiting from medical cannabis. I certify on average two-three new patients per day. Notably, many patients are finding relief for not just the condition they have been certified for, but also secondary conditions. Further, my patients are happier, suffer from less anxiety (many have

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ceased use of anti-anxiety medication), and are significantly reducing their pain. Quite a few have gotten off of narcotics and other pain killers altogether.

Practicing integrative medicine allows me to find the best treatment for my patients, and their success stories are what make my work so much fun. The beauty of integrative medicine is that it brings together different treatment methods to get the best effect for each individual patient. We use whatever modality we consider best for each patient's case. Our patients get the benefit of customized treatment plans that include conventional and complementary therapies. We combine all possible treatment options; whatever may help the patient in the most effective and safest way. And we are seeing great results using integrative approach.

Nausea is a common symptom of many conditions, or their treatments, including cancer and pain. Migraines are often accompanied by nausea, adding nausea to the program could significantly help my patients. Nausea is also often associated with PTSD, muscle spasms, and pain, all of which are currently covered by the program. Adding nausea to the program just makes sense.

Marinol — which is pure, synthetic THC — has been approved as a prescription drug since 1985 for nausea and vomiting associated with cancer chemotherapy in patients. Like other medications, Marinol can also be prescribed for off-label uses. However, Marinol is an inadequate substitute for many nauseated patients because, as a pill it is slow-acting. Also, unlike vaporized cannabis, a patient cannot precisely titrate their dosage and many end up overly intoxicated.

Autism, dementia, and Alzheimer's disease, are all marked by anxiety. Cannabis causes people to calm down. I have seen this many times with children in particular. For example, I had a young patient with seizures who, upon being placed on cannabis, changed her behavior drastically, she became better in school, improved in gymnastics, and had a higher quality of life. Offering cannabis to patients suffering from autism, dementia, and Alzheimer's disease, will result in a reduction in their anxiety and likely benefit these patients as to other symptoms they suffer from as well.

In addition, cannabis has been helpful at reducing self-injurious and aggressive behavior in autistic individuals who have not responded to other treatments. In Texas and Georgia, parents have talked to the media about their decision to break state law to help their autistic children, who were engaging in self-harm.

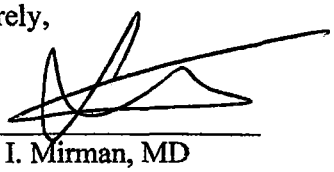
Liver disease often results in decreased appetite and nausea. Granting access for patients who suffer from this condition to medical cannabis, will likely help them battle these afflictions tremendously. Cannabis's alleviation of a decreased appetite is well-documented, and it is in the interest of my liver disease patients to have access to this important treatment option.

In my opinion, medical cannabis is the best pain medication of any pain medication available today either prescription or over the counter. It is much safer than opioids, and even safer than over-the-counter drugs like ibuprofen and Tylenol. Not only is cannabis incredibly effective, but there are few if any side effects and no risk of fatal overdose. Indeed in all my years of practicing

medicine, I have never seen a drug that has such a remarkable effect on patients with almost zero side effects.

Please add nausea, autism, dementia, Alzheimer's disease, liver disease, and chronic pain, to Minnesota medical cannabis program.

Sincerely,



Jacob I. Mirman, MD