

Cream for Diabetic Blisters and Complicating Leg Conditions

Julia Washburn, President, Willow Botanicals, LLC

Certificate in Aromatherapy, American College of Healthcare Sciences

482 Newhall Road, Conway, MA 01341

Introduction

According to MedicalNewsToday.com, in rare cases, people with diabetes may develop blisters known as "*bullosis diabeticorum* or diabetic bullae." (MedicalNewsToday.com, 2023) They are usually filled with clear liquid and are irritating or itchy. The blisters resolve themselves in two to five weeks and medical treatment focuses on preventing infection. Treatments can include saline compresses, bandages, steroids, and anti-biotic ointment. (MedicalNewsToday.com, 2023)



Diabetic blisters on leg. Photo Credit: consultant360.com., (2024)

This case study describes a complicated leg condition, including diabetic blisters, peripheral neuropathy, gout, and rusty leg syndrome. Together, these conditions caused my client itching and discomfort, leaving the skin on his legs very dry and cracked with blisters, which he calls pustules, and a rusty appearance. He was getting as many as five to fifteen or more diabetic blisters every week which were becoming infected. Attempting to soothe his discomfort and itching, we discovered a topical aromatherapy formula that eliminated the blisters altogether, soothed the itching and discomfort, and left his skin, in my client's words, "smooth and silky." This may have potential to help others experiencing diabetic blisters and similar leg conditions and is worth further study.



Description of Case

D.W. has provided written consent to be the focus of this case study. He is an 80-year-old man with diabetes, diabetic blisters, peripheral neuropathy, gout, and a condition called rusty leg syndrome that leaves iron deposits in his feet and lower legs. The skin on his legs and feet is stretched thinly due to swelling and is very dry, crusty, and cracked, erupting with infected blisters or pustules regularly.

D.W. is 6 foot 3 inches and weighs 230 pounds. For more than five years, D.W. has had peripheral neuropathy, causing discomfort and nerve damage in his feet and legs, possibly complicated by his diabetes. He has had bouts of gout for more than 30 years. He also suffers from long-term rusty leg syndrome, also known as hemosiderin staining, which leaves iron deposits in his legs and feet under the skin from leaky capillaries caused by poor circulation in the veins. It can cause pain, swelling, dry, flaky skin, and chronic infections. (WebMD., 2023) As a result, the skin on his legs and feet is stretched thinly due to swelling, extremely dry, crusty, and cracked. D.W. was recently diagnosed with diabetes and the skin on his legs erupts with five to fifteen blisters per week. Last year, D.W. had vascular surgery on his legs but reported that it did not help at all. Using a Likert scale, D.W. rates the swelling and pain in his feet and legs at six out of ten, where ten is high. He ranks the discomfort of his skin at nine out of ten. This condition limits his mobility and discourages him from exercising. D.W. regularly sees his primary care physician, who advised him to put moisturizing skin lotion on his legs. His doctor also directed him to pop the pustules and apply antibiotic ointment. D.W. reports only putting lotion on his feet and legs several times a week when he remembers. He uses facial tissues to pop and wipe the pustules weekly and puts on antibiotic lotion as his doctor advised. He says the lotion does not work very well.

D.W. has had acupuncture, massage, and reflexology with good results in the past but has not used aromatherapy. D.W. has heart disease and had bypass surgery and several operations on his arteries to clean them. He and his wife adopted a vegan diet two years ago, which has had a profoundly positive effect on his heart disease. According to his cardiologist, his arteries no longer produce much plaque and have cleared significantly. D.W. takes a blood thinner, a diuretic, high blood pressure medication, medications for his heart and angina, gout medication, thyroid and testosterone replacement medications, and medication for high cholesterol. D.W. is allergic to sulfa drugs but has no other allergies or sensitivities.

D.W. is a big man but not obese. He is cheerful and makes good eye contact. His voice is strong and deep. His teeth look good, with a little discoloration. His hands are washed and clean under the fingernails. He has a pleasant aroma, like baby powder. The skin on his swollen legs and feet is rust-colored and appears bruised. It looks like it is stretched thinly over his feet and legs. It is very dry, flaky, crusty, and has small cracks. There are several blisters and pustules filled with yellowish viscous puss along the cracks, which smell bad.

Outcome Goals:

There are various factors affecting D.W.'s legs and feet, causing him swelling, infection, and discomfort. Therefore, using a Likert scale of one to ten where ten is high to measure

outcomes, the goals for D.W.'s support plan are to relieve these symptoms and support healthier skin, legs, and feet:

1. Within one month, reduce pain and swelling in D.W.'s legs and feet from a six to a three or less.
2. Within one month, improve the damage and discomfort of the skin on D.W.'s legs and feet from an eight to a four or less.
3. Within one month, reduce the number of blisters/pustules on D.W.'s legs and feet from five to fifteen per week to less than five per week.

Therapeutic Action Strategy:

The therapeutic actions needed to support healthier skin, legs, and feet for D.W. include the following: Analgesic to relieve pain, anti-inflammatory to reduce swelling and calm inflamed skin, exfoliant, antioxidant, and cell proliferate to encourage healthy cellular re-growth, anti-aging to promote healthy skin, neuroprotectant and nerve to support and heal nerves in legs and feet, antiseptic, anti-bacterial and anti-microbial to reduce infection (reduce pustules), deeply moisturizing for dehydrated, crusty, cracked skin, vulnerary to heal the skin, support sebum production, and increase skin elasticity. (Petersen, D., 2022) (Petersen, D., 2020)

D.W. has several health issues, all conspiring to impact the nerves, veins, and skin on his legs and feet. According to the Mayo Clinic (2023), "peripheral neuropathy happens when the nerves that are located outside of the brain and spinal cord [peripheral nerves] are damaged," producing stabbing or burning pain in the extremities. Causes of peripheral neuropathy can include traumatic accidents, metabolic problems, inherited disorders, and exposure to toxins. D.W.'s rusty leg syndrome leaves the skin on his legs and feet very dry, crusty, and cracked. D.W.'s diabetes is causing diabetic blisters, making him susceptible chronic skin irritation and infections in the form of pustules. His gout causes his legs and feet to swell, stretching the skin and making it thin and cracked.

Method

Materials:

- Chamomile Roman Essential Oil (EO), *Chamaemelum nobile* (L.)
- Lavender EO, *Lavandula angustifolia* (Mill.)
- Peppermint EO, *Mentha x piperita* (L.)
- Ylang-Ylang EO, *Cananga odorata* (Lam.)
- CBD (Hemp) Oil, *Cannabis sativa*
- White Willow Bark Extract, *Salix alba*
- Aloe Vera Oil, *Aloe vera* (L.)
- Shea Butter, *Vitellaria paradoxa*
- Jojoba Oil, *Simmondsia chinensis*
- Camellia Oil, *Camellia kissi*

- Avocado oil, *Persea americana*
- Calendula, *Persea americana*, Infused Fractionated Coconut oil, *Cocos nucifera* (L.)
- St. John's Wort, *Hypericum perforatum* (L.), Infused Sweet Almond Oil, *Prunus amygdalus*, syn. *Prunus dulcis*
- Water
- BTMS (plant-based emulsifier)
- Glycerin
- 2 two-ounce plastic vacuum pump jars

Application Methods:

D.W. says he will try aromatherapy cream to support his legs and feet. His skin is damaged and dry, and a cream application method will moisturize and heal his skin while delivering essential oils and phytochemicals trans-dermally. (Petersen, D., 2022) The American Association of Holistic Aroma Therapy identifies aromatherapy creams as suitable application methods for skin care, including skin issues such as eczema, dermatitis, psoriasis, wound healing, improving circulation, softening and soothing the skin, balancing sebum production, skin aging, detoxification of the skin, and skin hydration. (American Association of Holistic Aromatherapy., 2023)

External Factors:

All the materials for this formula are relatively inexpensive and readily available online. Together, they will combine to make a smooth, deeply moisturizing, healing cream with a pleasant aroma, increasing the chances that D.W. will comply with the support plan.

Safety:

- CBD Oil, *Cannabis sativa*—Contraindicated for the following medications: ace inhibitors, anticoagulant/antiplatelet, estrogens, and minor interactions with antihypertensive drugs when taken orally in large doses.
- Chamomile Roman, *Chamaemelum nobile* (L.), has a toxic rating of I, is contraindicated during pregnancy, is on the GRAS list, and has no known drug interactions.
- Lavender, *Lavandula angustifolia* (Mill.), has a toxic rating of I, is on the GRAS list, and is contraindicated for CNS depressant medications.
- Peppermint, *Mentha x piperita* (L.), has a toxic rating of II, is on the GRAS and Substances Added to Food Lists, and is contraindicated for cyclosporine and cytochrome medications.
- White Willow Bark, *Salix alba*—Contraindicated for pregnancy and lactation. Contraindicated for the following medications: Acetazolamide, anticoagulant/antiplatelet, aspirin, choline magnesium, trisalicylate, and salicylate.
- Ylang-ylang, *Cananga odorata* (Lam.), has a toxic rating of II and is on the GRAS and Substances Added to Food Lists. There are no known drug interactions.
- Sweet Almond Oil, *Prunus amygdalus*, syn. *Prunus dulcis* should not be used if one is allergic to almonds or tree nuts.

(Petersen, D., 2020); ([NatMedPro., 2024](#))

Reasoning:

- Deeply moisturize—Shea butter, Fractionated Coconut Oil, Aloe Vera Oil, Avocado Oil (Petersen, D., 2022)
- Support sebum production—Jojoba Oil and Sweet Almond Oil (Petersen, D., 2022)
- Enhance skin elasticity—Camellia Oil (Petersen, D., 2022)
- Antimicrobial—Lavender EO, Peppermint EO, Chamomile Roman EO, Ylang Ylang EO (Petersen, D., 2020), St. John’s Wort (Petersen, D., 2022)
- Anti-inflammatory—Chamomile Roman EO, Ylang-Ylang EO, (Petersen, D., 2020) Calendula, St. John’s Wort (Petersen, D., 2022)
- Analgesic—Chamomile Roman EO, Lavender EO, Peppermint EO, Ylang Ylang EO, (Petersen, D., 2020), Calendula (Petersen, D., 2022), White Willow Bark Extract (Byrdie.com, 2023)
- Antioxidant—White Willow Bark Extract, (Byrdie.com, 2023), Calendula (Petersen, D., 2022)
- Cell Proliferant—Ylang Ylang EO (Petersen, D., 2020)
- Anti-aging—Jojoba Oil, Camila Oil, (Petersen, D., 2022) White Willow Bark Extract (Byrdie.com, 2023)
- Nervine—Lavender EO, Peppermint EO (Petersen, D., 2020)
- Antiphlogistic—Chamomile Roman EO (reduces swelling) (Petersen, D., 2020)
- Support Healthy Skin—White Willow Bark Extract (Byrdie.com, 2023)
- Antiseptic—Chamomile Roman EO, Lavender EO, Peppermint EO, (Petersen, D., 2020), Willow Bark Extract (Byrdie.com, 2023)
- Gentle Exfoliation—Willow Bark Extract (Byrdie.com, 2023)
- Vulnerary—Lavender EO, (Petersen, D., 2020), Calendula, St. John’s Wort (Petersen, D., 2022)

Ewelina, P., et al., (2020) conducted a study finding that White Willow Bark “*S. alba* extracts, especially the leaf extract, offer promise as a nontoxic natural antioxidant in cosmetic products or herbal medicines.” Givol, O., et al., (2019) reviewed studies on the benefits of calendula for wound healing. They “identified some evidence for the beneficial effects of *C. officinalis* extract for wound healing, consistent with its role in traditional medicine.” Ute, W., et al., (2014) showed that St. John’s Wort has several dermatological benefits, “including antioxidant, anti-inflammatory, anticancer, and antimicrobial activities.” In a recent review of cannabis and cannabinoid research, Nickels, M., and Lio, P., (2020) report that “the current literature indicates that CBDs may be beneficial in skin disease, particularly in the treatment of acne, chronic pruritus, and atopic dermatitis.” DaSilva, G., et al., (2015) conducted a study that “reveal[ed] (in vivo) the analgesic and anti-inflammatory activities of [lavender essential oil] and demonstrates its important therapeutic potential.” A literature review by Dai Y., et al., (2022) showed that “chamomile roman possess[es] anticancer, anti-infective, anti-inflammatory, antithrombotic, antioxidant, hypolipidaemic, hypoglycaemic, antihypertensive, antidepressant, neuroprotective activities, among others.” Peppermint essential oil has “strong anti-inflammatory, antibacterial, antiviral, scolicidal, immunomodulatory, antitumor,

neuroprotective, antifatigue and antioxidant activities. Also, [peppermint essential oil] shows pharmacological protection of gastrointestinal, liver, kidney, skin, respiratory, brain, and nervous systems and exerts hypoglycemic and hypolipidemic effects. Currently, [peppermint essential oil] is broadly utilized for gastrointestinal and dermatological diseases, postoperative adjuvant therapy, nutraceuticals, the cosmetic industry, and other fields.” (Zhao H., et al., 2022) A recent literature review of ylang ylang essential oil studies confirmed that “recent studies have shown a wide variety of bioactivities exhibited by the essential oils and the extracts of *C. odorata* including antimicrobial, antibiofilm, anti-inflammatory, antivector, insect-repellent, antidiabetic, antifertility and antimelanogenesis activities.”

Author’s note: Based on a thorough academic library search, no research on diabetic blisters and aromatherapy or essential oils was available. The literature reflects little to no research on the causes and treatment of diabetic blisters.

Formula

(Adapted from [SoapSchool](#), 2023, deep moisturizing cream recipe)

Oil Phase

BTMS (plant-based) Emulsifier: 10 ml

Shea Butter: 10 ml

Avocado Oil: 6 ml

Camila Oil: 3 ml

Jojoba Oil: 6 ml

Fractionated Coconut Oil: 15 ml

Aloe Vera Oil: 10 ml

Water Phase

Water: 116 ml

Glycerin: 6 ml

Cool Phase

Essential Oil Blend: 2 ml (1%)

Vitamin E: 1 ml

Willow Bark Extract: 9 ml

CBD Oil: 2 ml (1%)

Fractionated Coconut Oil infused with Calendula: 6 ml

Sweet Almond Oil infused with St. John’s Wort: 6 ml

Heat the oil phase ingredients and the water phase ingredients separately until they reach 175 degrees Fahrenheit. Combine the mixtures in a small bowl and beat with a stick blender for approximately 3 minutes until creamy. Add the cool phase mixture and continue beating for another minute until thoroughly blended. Allow cream to cool. Dispense into a two-ounce jar.



Essential Oil Blend

Chamomile Roman—30 drops

Lavender—30 drops

Peppermint—30 drops

Ylang-Ylang—30 drops

(1ml = 30 drops)

Client Instructions:

Conduct a skin patch test before using. Place a small amount of the cream in the crook of your arm and cover it with a band aid. Check after one hour, after five hours, and the next day. If your skin appears or feels irritated at any point, wash the area with soap and water and discontinue the use of the preparation. Call me, and we will try a different formula. If there is no skin irritation, proceed with the instructions. Also, note how your feet and legs feel on a scale of one to ten (ten is high) for pain and discomfort. Also, note the number of pustules.

Rub a generous amount of the cream on the skin of your feet and legs twice daily.

Keep notes about how the cream works for you. How does it make your skin feel? Does it help with pain and inflammation? Does it help the sores or pustules you sometimes get on your legs? Do you like it or dislike it, and why? Overall, how does it make your legs and feet feel?

Our goals are to reduce swelling and inflammation, soothe and moisturize skin, reduce infection, relieve pain, support healthy nerves, and support healthy cellular regeneration in the skin.

I created this formula exclusively for you. Do not allow others to use it. Keep out of the reach of children and pets. If you react negatively to the preparation, discontinue use and call me. If symptoms persist, contact your doctor.

Let's check in weekly over the next month to see how it works.

Client Response

When D.W. first applied the cream to his legs and feet, he noted its pleasant aroma and silky feel. After a week of use, D.W. asked me to feel how smooth the skin on his legs and feet had become. He was delighted.

Outcome Evaluation:

Using a ten-point Likert scale, where ten is high, D.W. reported—

1. Within two weeks, the swelling in D.W.'s legs and feet went from six to one.
2. Within two weeks, the damage and discomfort of the skin on D.W.'s legs and feet went from an eight to a zero.

3. Within two months, the number of blisters/pustules on D.W.'s legs and feet went from five to fifteen per week to one every other month.



D.W.'s clear leg skin. Photo Credit: D.W.

As time went on, D.W. continued to use the cream. Several times, he ran out of cream and the blisters returned. Thus far, I have sent him a new supply of cream twice. Both times when he resumed using the lotion, the blisters disappeared. As he continued applying the cream, D.W. reported the swelling and discomfort levels in his legs and feet had remained at one to zero, and his blisters were rare.

Reflection

1. How did external factors impact the client's response to treatment? External factors were minimal in this case. Materials were readily available. D.W. was able to comply fully, and his medications and health conditions did not pose side effects or prevent treatment.
2. How did client compliance play a role in the outcome? D.W. complied completely with the directions, applying the cream twice daily at first and then once daily for maintenance. This was important for the cream to have an effect.
3. What might you do differently? Things worked well; therefore, I would not do anything differently now. Monitoring D.W.'s condition overtime may suggest formula adjustments.

4. Reflect on how the outcome of your case study has changed your understanding. Consider how this new understanding can be extrapolated to new ideas, concepts, or ways of approaching your work and/or the topic you explored. I was surprised at how well the cream worked. Based on my research, I developed the formula. Seeing it work in real time was satisfying. I originally thought we could create something to ease D.W.'s discomfort and was pleased we were able to control his issue so completely. The idea that aromatherapy can have profound effects on symptoms as well as underlying conditions opens my thinking in my practice setting higher goals and expectations for myself. The lack of literature available on holistic approaches to diabetic blisters, or better treatment at all, is an opportunity for further research which I am eager to pursue. Helping people proactively manage this uncomfortable, difficult condition would be wonderful and well received.
5. Consider client's initial goals and compare to actual outcome. D.W. is very pleased with the outcomes. They far exceeded his expectations. He is delighted to have smooth, silky skin on his legs with almost no discomfort or blisters.

Evaluation

1. State the outcome from the client's perspective as well as what can be learned from the outcome and why it had an impact on you. D.W. is very pleased with the outcome. He has gotten considerable relief using the cream. He stated he feels "100% better." While this is an anecdotal case study, the results are profound and worthy of further study. I am surprised as to how well the cream worked. This has motivated me to publish this case study and pursue further research on the topic, especially due to the lack of research on treatments for diabetic blisters and especially research on aromatherapy for this condition. Further research and publication may positively impact others suffering from this condition.
2. How are external factors monitored that could affect outcome – client compliance, medications, diet, etc.? D.W. and I connect once a month to discuss his condition and how the cream works. He tells me about any new developments in his health and treatments and how he is using the cream, any of which could impact the treatment's outcome.
3. What new questions does your case study raise? Is there an effective treatment to relieve discomfort from diabetic blisters and other similar conditions that could be readily available for patients and health care providers? Is this cream's success a coincidence or can it be replicated in other cases? Is there a specific ingredient in the cream that is responsible for D.W.'s positive outcomes, or is there a synergy between

ingredients? Can the success of this cream be proven in an empirical study, and how might that impact further research in aromatherapy or treatment of diabetic blisters.

4. Case studies are anecdotal. To what extent can your findings be regarded as reliable? This case study needs replicating with other people who experience diabetic blisters and similar skin conditions. The findings may be reliable because D.W.'s symptoms returned when he stopped using the cream. However, it is not clear if this effect is replicable in other people. Further study is needed.
5. Do you feel your study is worth replicating or expanding? This case study is worth replicating because it has the potential to relieve discomfort for others suffering from diabetic blisters and other similar skin symptoms. It is worth trying to isolate which ingredients may be causing the desired effect or identify synergies between the ingredients for more targeting treatment.
6. What is the relevance of your case study, or a particular aspect of it, to future practice or research? This case study is relevant to relieving discomfort for people suffering from diabetic blisters and other similar skin conditions. Given there is little to no research on the causes and treatment of diabetic blisters, much less the effects of aromatherapy on this condition, further study is merited.

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