

Herbs & Essential Oils: The Good, The Bad, and the Unknown



Tieraona Low Dog, MD

Founder: Medicine Lodge Ranch

Author: National Geographic's *Life Is Your Best Medicine, Healthy At Home, and Fortify Your Life*

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Disclosures

- Consultant: Healthy Lifestyle Brands
- Consultant: MegaFood
- Cofounder: Rightful
- Cofounder: WildCrafter Botanicals
- President: Medicine Lodge Ranch Education
- Book royalties: National Geographic, Elsevier, Oxford University Press
- Chair: United States Pharmacopeia Dietary Supplements Admissions Joint Standard Setting Sub-Committee

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A Moment to Introduce Myself

- Herbalist, midwife and massage therapist prior to graduating from University of New Mexico Medical School. Licensed MD, boarded in integrative medicine.
- Fellowship Director at the University of Arizona Center for Integrative Medicine for many years, training ~700 health professionals in 2-year integrative medicine fellowship.
- Appointed by President Bill Clinton to White House Commission on Complementary and Alternative Medicine Policy.
- Appointed by Secretary HHS to Advisory Council of NIH National Center for Complementary and Alternative Medicine (now Complementary & Integrative Health)
- Served as Chair of numerous US Pharmacopeia dietary supplement and botanical committees since 2000.
- Published >50 peer-reviewed medical journal articles, written 24 medical textbook chapters and written/edited six books, 4 with National Geographic and spoken at more than 500 medical/scientific conferences.

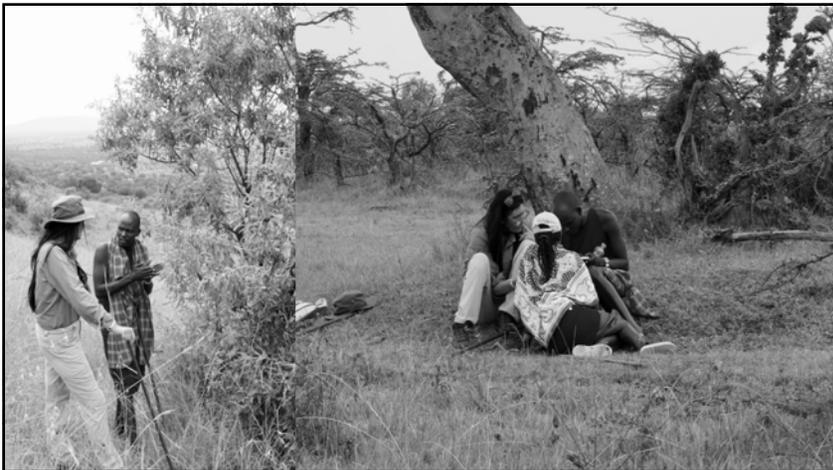


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Herbal Medicine's Rich History

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Opium Poppy *(Papaver somnifera)*

- At least 3000 years ago, opium latex, which contains morphine and related alkaloids such as codeine was being used.
- Morphine “the god of dreams” in Greek mythology.
- Serturmer isolated morphine in 1806.
- Codeine and morphine still widely used today as analgesics

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Atropa belladonna
Hyoscyamus niger

- Used by Italian women to dilate pupils as making them appear more attractive.
- Source of atropine, scopolamine (anticholinergic) alkaloids: antispasmodic in GI tract, bronchodilators, anti-emetic (motion sickness,) dilate pupils, narcotic, psychotropic.
- Still widely used in medicine.

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Foxglove
Digitalis purpurea

- William Withering learned about foxglove from herbwyfe in Shropshire.
- Digitoxin and digoxin derived from foxglove (and others) revolutionized our ability to treat congestive heart failure.

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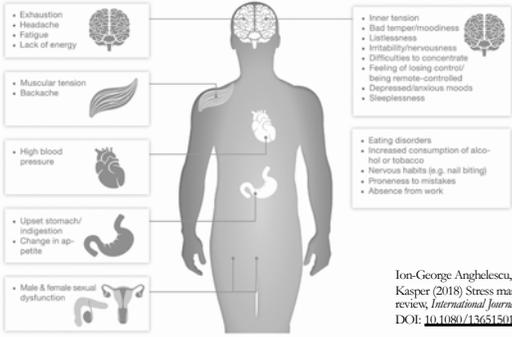


*Herbal Medicine in
Modern Times:
The Potential*

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WHO has called stress ‘the health epidemic of the 21st century’.

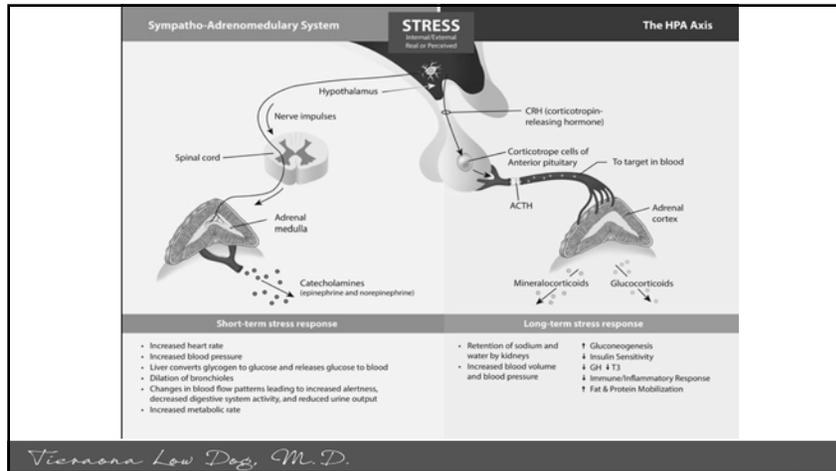


- Exhaustion
- Headache
- Fatigue
- Lack of energy
- Inner tension
- Bad temper/moodiness
- Listlessness
- Irritability/nervousness
- Difficulties to concentrate
- Feeling of losing control/ being remote-controlled
- Depressed/darkness moods
- Sleeplessness
- Muscular tension
- Backache
- Eating disorders
- Increased consumption of alcohol or tobacco
- Nervous habits (e.g. nail biting)
- Propensity to mistakes
- Absence from work
- High blood pressure
- Upset stomach/ indigestion
- Change in appetite
- Male & female sexual dysfunction

Ion-George Angheliescu, David Edwards, Erich Scifritz & Siegfried Kasper (2018) Stress management and the role of *Rhodiola rosea*: a review, *International Journal of Psychiatry in Clinical Practice*. DOI: [10.1080/13651501.2017.1417442](https://doi.org/10.1080/13651501.2017.1417442)

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Rhodiola rosea L.

- Plant: perennial with thick leaves and stem; yellow, fragrant flowers. Crassulaceae
- Part Used: **root and rhizomes**
- Used in traditional medicine of Russia, Scandinavia, and other northern latitude countries for centuries.
- Used to increase **physical endurance, work productivity, longevity, and nervous disorders.**
- **“Anti-fatigue agent”** in Sweden, most commonly used psychostimulant in officially registered herbal medicinal products.



Khana K, et al. Golden root: A wholesome treat of immunity. *Biomed Pharmacother* 2017; Mar;87:496-502.

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Mechanistic Studies



- **More than 70 mechanistic studies** published for *R. rosea* and/or its principal constituents, such as rosavins or salidroside.
- Rhodiola shown to have **antioxidant, anti-stress, antimicrobial, immunomodulatory, cardio-protective, neuroprotective and anti-tumor effects.**

Panosian A, et al. Mechanism of action of Rhodiola, salidroside, tyrosol and triandrin in isolated neuroglial cells: an interactive pathway analysis of the downstream effects using RNA microarray data. *Phytomedicine* 2014 Sep 25;21(11):1325-48.

Recio MC, et al. Immunomodulatory and Antiproliferative Properties of Rhodiola Species. *Planta Med* 2016 Jul;82(11-12):952-60

Nabavi SF, et al. *Rhodiola rosea* L. and Alzheimer's Disease: From Farm to Pharmacy. *Phytother Res* 2016 Apr;30(4):532-9.

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Table 1
Randomized and non-randomized clinical trials of Rhodiola in mental fatigue, stress-induced fatigue, fatigue syndrome and asthenia.

Adaptogen (active principle)	Indication for use and/or pharmacological activity	Number of trials	Number of subjects	Grade of recommendation	
				EMA ^a	NSR ^b
<i>Rhodiola rosea</i> (Rhodioside)	Mental fatigue: Rhodiola can improve attention in cognitive function in fatigue after single and repeated administration.	3	257	A	A
	Fatigue syndrome: Rhodiola has anti-fatigue effect in physical, emotional, and mental exhaustion.	1	60	A	B
	Mild depression: Rhodiola has an anti-depressive effect	1	89	A	B
	Stimulating effect: Rhodiola can improve mental performance after single dose administration	3	419	B	B
	Stimulating effect: Rhodioside can improve mental performance after single dose administration	1	46	B	

^a Grade of recommendation based on the European Medicines Agency Assessment Scale [EMA/HMPC/104613/2005]:
Grade A. Evidence levels quality Ia, Ib - Requires at least one randomized controlled trial as part of the body of literature of overall good consistency addressing the specific recommendation;
Grade B. Evidence levels IIa, IIb, III - Requires availability of well-conducted clinical studies but no randomized clinical trials on the topic of recommendation;
Grade C. Evidence level IV - Requires evidence from expert committee reports or opinions and/or clinical experience of respected authorities but indicates absence of directly applicable studies of good quality.

^b Grade of recommendation according to Natural Standards Evidence-Based Validated Grading Rationale (Basch and Ubbicht, 2005):
Grade A. Strong scientific evidence - Statistically significant evidence derived from: (i) more than two properly conducted randomized controlled trials (RCT), or (ii) one properly conducted randomized controlled trial, and one properly conducted meta-analysis, or (iii) multiple RCTs with a clear majority of the properly conducted trials and with supporting evidence in basic science, animal studies or theory;
Grade B. Good scientific evidence - Statistically significant evidence derived from: (i) one or two properly conducted randomized trials, or (ii) one or more properly conducted meta-analysis, or (iii) more than one cohort/case control/non-randomized trials and with supporting evidence in basic science, animal studies or theory.

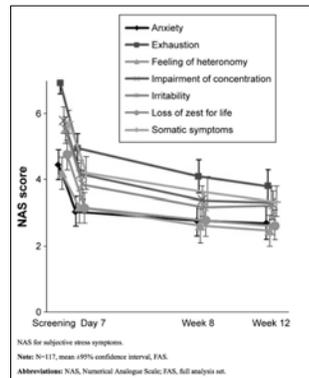
Panosian AG. Rosenroot (*Rhodiola rosea*): Traditional use, chemical composition, pharmacology and clinical efficacy. *Phytomedicine* 2010; 17(7): 481-93.

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Open Label Study

- Multicenter trial 118 outpatients with **burnout syndrome** (multiple validated scales) found 400 mg/d *R. rosea* extract ((1.5–5:1, WS[®] 1375, Rosalin) over 12 weeks **had significant beneficial effect on symptoms.**



Kaspar S, et al. *Neuropsychiatr Dis Treat* 2017; 13: 889–898

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27 March 2012 EMA/HMPC/232100/2011
Committee on Herbal Medicinal Products (HMPC)
Assessment report on *Rhodiola rosea* L. rhizoma et radix

- “The traditional use as an adaptogen ‘*for temporary relief of symptoms of stress such as fatigue and sensation of weakness*’ is appropriate for traditional herbal medicinal products.”
- “The long-standing use as well as the outcome of the clinical trials support the plausibility of the use of the mentioned herbal preparation in the proposed indication.”

https://www.ema.europa.eu/documents/herbal-report/final-assessment-report-rhodiola-rosea_en.pdf Accessed November 1, 2018

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The following are **acceptable claims on Rhodiola label:**

- Used in herbal medicine to help **support cognitive function**
- Used in herbal medicine as an adaptogen to help to **temporarily relieve symptoms of stress (such as mental fatigue and sensation of weakness)**

<http://webprod.hc-sc.gc.ca/nhp/nd-bdipsn/atReq.do?atid=rhodiol&lang=eng>

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- R. rosea* very favorable safety profile.
- In clinical studies, **no serious side effects** have been reported.
- Mild side effects noted:** insomnia, dry mouth and mild headache.
- Animal data failed to show any significant adverse effects.**
- Safety in pregnancy and breastfeeding not available.**

Ion-George Angheliescu, et al. *International Journal of Psychiatry in Clinical Practice*. DOI: 10.1080/13651501.2017.1417442
https://www.ema.europa.eu/documents/herbal-report/final-assessment-report-rhodiola-rosea_en.pdf Accessed November 1, 2018

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Ashwagandha Root (and Leaf) (*Withania somnifera*)

- Significant stress protecting, anxiolytic, analgesic & anti-inflammatory effects.
- **Most calming of “adaptogenic” herbs.**
- Clinical study showed ashwagandha root extract (KSM-66, Ixoreal Biomed) 300 mg twice daily for 60 days **reduced stress levels by 33-44% and cortisol levels by 22-28% compared to baseline in adults with chronic stress.** Improvements significant compared to placebo.



Chandrasekhar K, et al. A prospective, randomized double-blind, placebo-controlled study of safety and efficacy of a high-concentration full-spectrum extract of ashwagandha root in reducing stress and anxiety in adults. *Indian J Psychol Med.* 2012;34(3):255-62

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- Traditionally used in Ayurveda to relieve **general debility, especially during convalescence or old age.**
- Traditionally used in Ayurveda as a **sleep aid.**
- Traditionally used in Ayurveda for **memory enhancement.**

<http://webprod.hc-sc.gc.ca/nhp/nd-bdipsn/monoReq.do?id=35&lang=eng>

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Ashwagandha and Weight Management?

- RDBPCT 52 subjects chronic stress given 300 mg ashwagandha extract (KSM-66) or placebo BID for 8 weeks.
- Ashwagandha group had significant improvements in primary and secondary measures (**weight loss, food cravings, stress levels**), no adverse effects.
- **“Ashwagandha root extract might help body weight management in adults under chronic stress.”**



Choudhary D, et al. Body Weight Management in Adults Under Chronic Stress Through Treatment With Ashwagandha Root Extract: A Double-Blind, Randomized, Placebo-Controlled Trial. *J Evid Based Complementary Altern Med.* 2017 Jan;22(1):96-106.

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Ashwagandha Joint Pain

- Animal models demonstrate ashwagandha has analgesic, anti-inflammatory and chondroprotective effects.
- **60 patients knee pain** randomized to ashwagandha extract (Sensoril: 250 mg or 125 mg) or placebo twice daily x 12 weeks.
- **At 12 weeks, significant reduction in WOMAC and knee swelling index in 250 mg BID group (p<0.001) and 125 mg BID group (p<0.05).**
- Pain significantly reduced in both groups (p<0.01). Group taking 250 mg BID **showed earliest efficacy at 4 weeks. Well tolerated.**

Ramakanth GS, et al. A randomized, double blind placebo controlled study of efficacy and tolerability of *Withania somnifera* extracts in knee joint pain. *J Ayurved Integr Med* 2016 Jul - Sep;7(3):151-157.

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Ashwagandha in MCI

- Prospective RDBPCT: 50 adults MCI
- 300 mg BID ashwagandha extract or placebo for 8 weeks
- Ashwagandha: **significant improvement in both immediate and general memory (Wechsler Memory Scale III) and significantly greater improvement in executive function, sustained attention, and information-processing speed compared to placebo** ($p=0.006$)
- *Potential effect on thyroid hormones*



Choudhary D, et al. *J Diet. Suppl.* 2017; Nov 2;14(6):599-612

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Turmeric (*Curcuma longa*)

- Family: Zingiberaceae (ginger family)
- More than 130 species worldwide
- Part Used: Rhizome
- Perennial plant grown in tropical areas, most grown in India, they consume 80% of crop. Used in meat, fish and vegetable curries.
- Long history of medicinal use ~4,000 years.
- In ancient Ayurvedic literature, called Jayanti, meaning “one who is victorious over disease.”



www.ncbi.nlm.nih.gov/books/NBK92752/ Accessed September 2, 2018

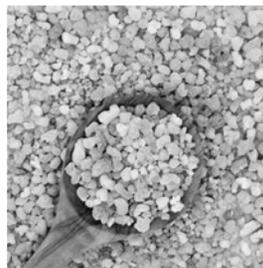
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Turmeric + Boswellia (*Boswellia serrata*)

- 12 week randomized, double-blind, placebo controlled study in 201 people with osteoarthritis (40-70 years of age) found that **350 mg curcuminoids + 150 mg boswellic acid taken three times daily** led to statistically significant effect on physical performance tests and WOMAC joint pain index compared to placebo. Well tolerated, no significant adverse events.



Haroyan A, et al. Efficacy and safety of curcumin and its combination with boswellic acid in osteoarthritis: a comparative, randomized, double-blind, placebo-controlled study. *BMC Complement Altern Med* 2018 Jan 9;18(1):7.

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Tuft's Review 11 RCTs: Turmeric and Boswellia and Osteoarthritis

- Curcumin and boswellia **significantly more effective than placebo for pain relief/functional improvement.**
- No significant differences between curcumin, boswellia and placebo in **safety outcomes.**
- **Curcuminoids** similar efficacy to NSAIDs; **significantly less likely** to experience gastrointestinal adverse events.
- “Curcumin and boswellia formulations could be valuable addition to **knee OA treatment regimens by relieving symptoms while reducing safety risks.**”



Banmuru RR, et al. Efficacy of curcumin and Boswellia for knee osteoarthritis: Systematic review and meta-analysis. *Semin Arthritis Rheum* 2018 Mar 10; pii: S0049-0172(18)30002-7

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Turmeric: Cardiovascular

- **Meta-analysis 20 studies** found a significant decrease in **serum triglycerides and elevation of HDL-C**
- A 12 week randomized, placebo controlled trial in 118 people with type-2 diabetes found that **1000 mg curcumin + 10 mg piperine/d led to significant reduction in serum total cholesterol, non-HDL-C and lipoprotein (a)**

Simental-Mendia LE, et al. Lipid-modifying activity of curcuminoids: A systematic review and meta-analysis of randomized controlled trials. *Crit Rev Food Sci Nutr* 2017 Nov 29:1-10.
 Panahi Y, et al. Curcuminoids modify lipid profile in type 2 diabetes mellitus: A randomized controlled trial. *Complement Ther Med* 2017 Aug;33:1-5.

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Turmeric Mouthwash

- Clinical study 60 patients over 21 days found both 0.2% chlorhexidine and 0.1% turmeric mouthwash could be effectively used as adjunct to mechanical plaque control in prevention of plaque and gingivitis.
- Both mouthwashes had comparable anti-plaque, anti-inflammatory and anti-microbial properties.



Mali AM, et al. *J Indian Soc Periodontol* 2012 Jul-Sep; 16(3): 386-391.

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Turmeric for Depression?

- Meta-analysis 6 studies: curcumin reduced depression symptoms, particularly in middle-aged patients when given at higher doses for longer periods of time.
- Authors concluded, “there is supporting evidence that curcumin administration reduces depressive symptoms in patients with major depression.”
- Is this an impact on microbiome? Is it due to systemic reduction in inflammation?



Al-Kawari D, et al. *Phytother. Res* 2016; 30(2):175-83

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Absorption and Bioavailability

- **<1% curcumin reaches peripheral blood after oral ingestion even at high doses (12 grams).** Only organ exposed to high concentration is **gastrointestinal tract.**
- To enhance absorption: piperine from black pepper or use lipid bound (Meriva) product.
- Piperine, alkaloid of black pepper **increases bioavailability curcumin 2000%.** **Do NOT exceed 20 mg/d piperine to avoid drug interactions.**



Metzler M, Pfeiffer E, Sculz SI, et al. Curcumin uptake and metabolism. *Biofactors* 2013; 39(1): 14-20
 Hewlings SJ, et al. Curcumin: A Review of Its' Effects on Human Health. *Food* 2017 Oct 22;6(10), pii: E92.

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Aloe Vera Gel

- Antiseptic/anti-inflammatory gingivitis and periodontitis
- Mouth rinses: reduction in gingivitis and plaque accumulation after use
- Anti-viral: herpes simplex
- Reduce oral ulcer pain
- Inhibits oral candida

Scientific name (Family name)	Subjects	Outcomes	Reference
<i>Aloe vera</i> (L.) Durm.f. (Asphodelaceae)	120 volunteers with gingivitis aged 18–25 years old	Inhibition of gingivitis and plaque accumulation after oral rinse	Chandras et al. (2012)
	45 patients with plaque-induced gingivitis aged 18–65 years old	Reduction of gingival inflammation	Ajmera et al. (2013)
	345 healthy subjects	Reduction of gingival bleeding and plaque indices	Karim et al. (2014)
	76 intubated patients in intensive care unit aged 18–64 years old	Reduction of gingival index compared with chlorhexidine	Rezaei et al. (2016)
	390 healthy subjects	Reduction of gingival index compared with chlorhexidine	Vangipuram et al. (2016)

Sujatha G, et al. Aloe vera in dentistry. *J Clin Diagn Res* 2014; 8(10): Z101–Z102.

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Aloe vera



- Cochrane review: found statistically significant evidence of benefit for aloe preventing or reducing severity of mucositis in patients undergoing cancer treatment.
- Aloe gel improved oral lichen planus in 22/27 patients compared to 1/27 in placebo group.

Choonhakam C, et al. *Br J Dermatol* 2008; 158:573-7; Rajar UD, et al. *J Coll Physicians Surg Pak* 2008; 18:612-14
 Worthington HV, et al. *Cochrane Database Syst Rev* 2011; 4: CD 000978; Langmead, et al. *Aliment Pharmacol Ther.* 2004 Apr 1;19(7):739-47.

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Elder berry *Sambucus nigra*

- Long history across many disparate cultures as a treatment for respiratory infections.
- Numerous compounds thought active for antiviral and immune priming effects.
- Possesses antimicrobial activity against Gram-positive bacteria *Streptococcus pyogenes* and group C and G Streptococci, and the Gram-negative bacterium *Branhamella catarrhalis*.



Porter RS, et al. A Review of the Antiviral Properties of Black Elder (*Sambucus nigra* L.) Products. *Phytother Res* 2017 Apr;31(4):533-554.

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Table 3. Human clinical studies on the effects of various *Sambucus nigra* treatments against influenza

Study	Treatment	dosage	n	Results	p
Zakay-Rones et al., 1995	Sambucol®	4 tsp (all adults) once daily for 2 days	25	Absence of side-effects in healthy adults	
		4 tsp (adults) or 2 tsp (children) once daily for 2 days	27	Recovery from fever in 4 days instead of 6 or more days Symptomatic improvement in 2 days instead of 5 or more days Complete recovery in 2–3 days instead of 5 or more days	<0.01 <0.001 <0.001
Korlee, 1998 Zakay-Rones et al., 2004	Sambucol®	15 mL four times daily for 5 days	60	Lessened duration of illness All individual symptoms relieved in 2–4 days instead of 7–8 days Global assessment showed pronounced improvement after 3 days instead of 7 days	<0.001 <0.001 <0.001
				Less use of rescue medication than control Absence of side-effects in patients	<0.001
Kong, 2009	Elderberry extract lozenge from HerbalScience Singapore Pte. Ltd.	4 lozenges daily for 2 days	64	24 h: significant improvement in all symptoms except coughing and mucus discharge 48 h: significant improvement in all symptoms 48 h: complete eradication of all symptoms in 28% of treatment group and 0% of control group	<0.0001 <0.0001
				Absence of side effects in patients Lessened symptom severity Lessened illness duration No significant difference in use of rescue medications Less occurrence of illness in treatment group (not significant)	0.05 0.02 0.9 0.2
Tsai et al., 2016	Rubini capsules	2 capsules/day priming (9 days), then 3 capsules/day (6 days)	29		
			312		

All studies were randomized, double-blinded, and placebo-controlled, with acceptable patient compliance.
 Copyright © 2017 John Wiley & Sons, Ltd. *Phytother. Res.* 31: 533–554 (2017)

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- Safety good for **cooked fruit** and elder flowers.
- Cost good for elderberry extracts in marketplace. Given complexity of the antiviral activity, resistance is unlikely to occur.
- Take elderberry extracts as instructed on label every 4 hours at first sign of infection.



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Supplement Facts		
Serving Size: 2 teaspoons (10 ml)		
Servings Per Container: 23		
	Amount Per Serving	%Daily Value
Calories	30	
Total Carbohydrate	8 g	3%†
Sugars	8 g	**
Elderberry Extract (berry)	3.8 g	**

† Percent Daily Values are based on a 2,000 calorie diet.
** Daily Value not established.



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Are there safety concerns?

Elderberry fruit extract is **POSSIBLY SAFE** when taken by mouth for up to 12 weeks. It's not known if taking elderberry fruit extract is safe when used for longer periods of time.

Elderberry is **POSSIBLY UNSAFE** when the leaves, stems, unripe fruit, or uncooked fruit is eaten. The cooked elderberry fruit seems to be safe, but raw and unripe fruit might cause nausea, vomiting, or severe diarrhea.

- **Children**
Oral:
Influenza: An elderberry fruit extract (Sambucol, Nature's Way) 15 mL (1 tablespoon) twice daily for 3 days, starting within 48 hours of initial symptoms, has been used (5260). A specific product containing echinacea and elderberry (Echinaforce Hot Drink, A. Vogel Bioforce AG) 5 mL mixed with 150 mL of hot water five times daily for 3 days, then three times daily for 7 days, has been used in children 12 years and older (95650).

<https://naturalmedicines-therapeuticresearch-com.ezproxy4.library.arizona.edu/databases/food-herbs-supplements/professional.aspx?productId=434#dosing>, Accessed January 17, 2019

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Echinacea and Elderberry

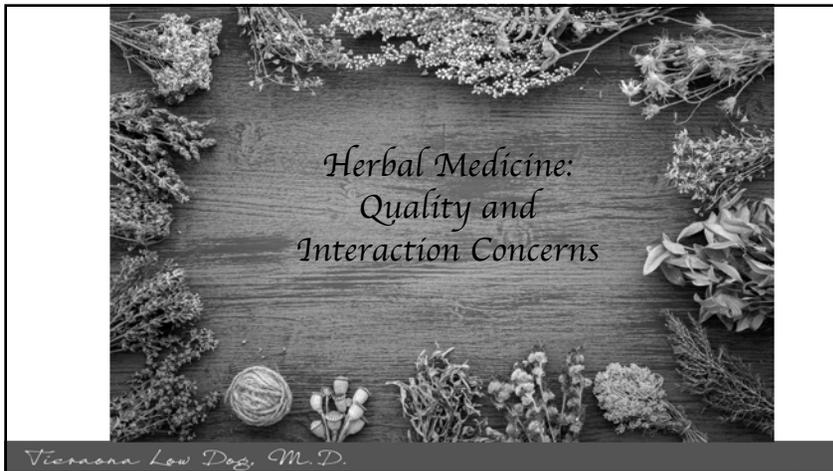
- 473 patients with flu symptoms less than 48 hours randomized to **240 mg echinacea herb/root extract + elderberry fruit** (Vogel Bioforce) or **tamiflu**.
- No difference between recovery rates, antibiotic use, intermediate doctor visits, use of over-the-counter medications for symptoms, “ability to return to normal daily activities,” or physician- and patient-reported efficacy of the treatments.
- Safety very positive.



Rauš K, et al. *Curr Ther Res.* 2015 Dec; 77: 66–72.

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Challenges for Clinicians

- Concerns over **QUALITY** of supplements, particularly botanicals.
- Concerns over potential **supplement-drug interactions**.
- Unclear where to go for **unbiased and relevant** information.
- Marketplace is just so big, so **MANY products**. Labels hard to interpret.
- Not adequately trained to confidently counsel patients about their use, **which increases risk for supplement drug interactions, failure to detect/anticipate adverse effects, and being unable to appropriately recommend supplements that would be beneficial.**

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Quality

- **Domestically produced products** generally better quality than those imported from China or India, though, this is improving
- **3rd party testing** (e.g., USP, NSF, CL, NNFA) **good quality indicator.**
- Be cautious and skeptical for products in **weight loss, sexual enhancing or bodybuilding** categories. Adulteration still occurs.
- **Consumer Labs** can be a useful website for assessing quality.

Search Criteria	Product Name	Company	Hidden Ingredient	Product Category
10/12/2018	Probiotic	Various Distributors	aluminum	Sealed Container
10/12/2018	Vitamin	Various Distributors	aluminum	Sealed Container
10/12/2018	Energy Tonic	Various Distributors	aluminum	Sealed Container
10/12/2018	ADRENAL	Various Distributors	aluminum	Sealed Container
10/12/2018	Maximum Power!	Various Distributors	aluminum	Sealed Container
10/12/2018	Strongest Natural Stim	Various Distributors	aluminum	Sealed Container
10/12/2018	Like Wine Coffee	Various Distributors	aluminum	Weight Loss
10/12/2018	USA for Women	Various Distributors	aluminum	Sealed Container
10/12/2018	Green Leaf Body Care	Various Distributors	aluminum, 10-aminophenanthroline	Weight Loss
10/12/2018	Search Quick Slimming Capsule	Various Distributors	aluminum, 10-aminophenanthroline	Weight Loss
10/12/2018	in Shape	Various Distributors	aluminum	Weight Loss
10/12/2018	BodyFit Intake	Various Distributors	aluminum	Weight Loss
10/12/2018	Eye 3 Day	Various Distributors	aluminum	Weight Loss
10/12/2018	Bleeding Capsule	Various Distributors	aluminum	Weight Loss
10/12/2018	Extreme Nutrition Supplement	Various Distributors	aluminum	Sealed Container
10/12/2018	Phenylethylamine 400	Various Distributors	aluminum	Sealed Container
10/12/2018	Extreme Plus	Various Distributors	aluminum	Sealed Container
10/12/2018	ERC	Various Distributors	aluminum	Sealed Container
10/12/2018	Apex Power Platinum 1000	Various Distributors	aluminum	Sealed Container
10/12/2018	Scrub	Various Distributors	aluminum	Sealed Container
10/12/2018	1000Pound Lite	Various Distributors	aluminum	Weight Loss
10/12/2018	Slip of the Lip	Various Distributors	aluminum	Sealed Container
10/12/2018	Black Rhino 2000	Various Distributors	aluminum	Sealed Container
10/12/2018	Platinum Rhino 2000	Various Distributors	aluminum	Sealed Container
10/12/2018	Black Rhino 1000	Various Distributors	aluminum	Sealed Container
10/12/2018	Alking Rhino	Various Distributors	aluminum	Sealed Container
10/12/2018	Red Rhino 2000	Various Distributors	aluminum	Sealed Container
10/12/2018	Red Rhino	Various Distributors	aluminum, calcium	Sealed Container
10/12/2018	Alcorno	Various Distributors	aluminum, 10-aminophenanthroline, 10-aminophenanthroline	Weight Loss

https://www.accessdata.fda.gov/scripts/sda/sdNavigation.cfm?filter=&sortColumn=1d&sd=tainted_supplements_cd&page=1 Accessed Oct 1, 2018

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USP Verified Dietary Supplements

Over 100 different dietary supplement formulas have received the USP Verified Mark, representing several different brands and retailers. Here are three different ways you can find a quality supplement.

Supplement Types	Brands	Retailers

<https://www.quality-supplements.org/verified-products>

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Herb-Drug Interactions



- Safety concerns: **potential** for dietary supplements to **interact with the absorption, transport, and/or metabolism** of pharmaceutical drugs.
- While *preclinical data* suggests many herbs may interact with drugs, clinical studies of most botanicals predicted to interact with drugs **have shown no clinically significant effects**.
- More **crucial** drug for medical purposes and/or **more narrow** the therapeutic window – **more closely need to watch for interactions**.
- **Pharmacists** can be great allies for monitoring potential interactions.
- There are numerous drug-supplement checkers on the Internet.

Sprouse AA, van Breemen RB. *Drug Metab Dispos* 2016;44:162-171

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Home | Tools | Interaction Checker | Feedback

Search: Chamomile

Selected Agents: Melatonin, Concerta (Methylphenidate), Sibutramine Tartrate, Chamomile

Interactions found:
Concerta <<interacts with>> MELATONIN contained in "Melatonin"
 Interaction Rating = **Moderate Be cautious with this combination.**

Disclaimer: Currently this does not check for drug-drug or supplement-supplement interactions. This is not an all-inclusive comprehensive list of potential interactions and is for informational purposes only. Not all interactions are known or well reported in the scientific literature, and new interactions are continually being reported. Input is needed from a qualified healthcare provider including a pharmacist before starting any therapy. Application of clinical judgement is necessary.

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Check for supplement-drug interactions.

<https://naturalmedicines-therapeuticresearch-com.ezproxy4.library.arizona.edu/tools/interaction-checker.aspx#E>

Accessed Jan 17, 2019

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You can go deeper into interactions

Concerta <<interacts with>> MELATONIN contained in "Melatonin" Hide Details
 Interaction Rating = **Moderate Be cautious with this combination.**

SEIZURE THRESHOLD LOWERING DRUGS

Interaction Rating = **Moderate Be cautious with this combination.**

Severity = **High** • Occurrence = **Possible** • Level of Evidence = **D**

Some clinical evidence suggests that melatonin may increase the frequency of seizures in certain patients, particularly children who are neurologically disabled (8248,9744). Theoretically, taking melatonin with drugs that also lower the seizure threshold might increase the risk of seizure activity. Some drugs that lower the seizure threshold include anesthetics (propofol, others), antiarrhythmics (mexiletine), antibiotics (amphotericin, penicillin, cephalosporins, imipenem), antidepressants (bupropion, others), antihistamines (cyproheptadine, others), immunosuppressants (cyclosporine), narcotics (fentanyl, others), stimulants (methylphenidate), theophylline, and others.

<https://naturalmedicines-therapeuticresearch-com.ezproxy4.library.arizona.edu/tools/interaction-checker.aspx#E>

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The Use of Essential Oils

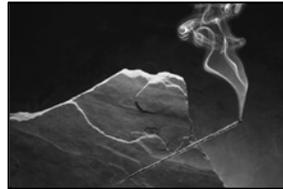


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Aromatherapy

- Resin and woods **burned for their scent** since ancient times. Fragrant herbs, gums and resins soaked in animal fat to extract scent and medicine. Incense often used in ceremony and ritual.
- The Latin *per* and *fume* means “through smoke.”
- Pleasant aromas were associated with good and holy, malodorous aromas associated with bad and evil. **Stench equaled disease.**



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Essential Oils

- *Essential oil* is an aromatic substance originating from a plant: seeds, bark, stems, roots, flowers, etc. **When you smell sage or lavender, you are perceiving the scent of the essential oil.**
- They are **highly concentrated** and **safety must be considered.**



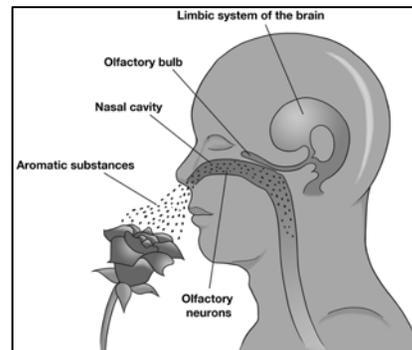
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“It is clear that the sense of smell is more than a primitive phenomenon with little to tell us about higher brain function. ***There is a richness of meaning in olfaction that links us to the primitive and to the complexities of human behavior.***”

Science of Olfaction, by Anholt



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Smell: It's Personal

- People perceive odors differently.
 - Study in UK in 1960s found wintergreen was least preferred aroma.
 - In US in 1970s, researchers found wintergreen most preferred aroma.
- Participants in UK associated wintergreen with analgesics used extensively during the war.
- Participants in US associated it with candy and freshness.



[https://commons.wikimedia.org/wiki/File:Wintergreen_\(6022861577\).jpg](https://commons.wikimedia.org/wiki/File:Wintergreen_(6022861577).jpg)

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Definitions

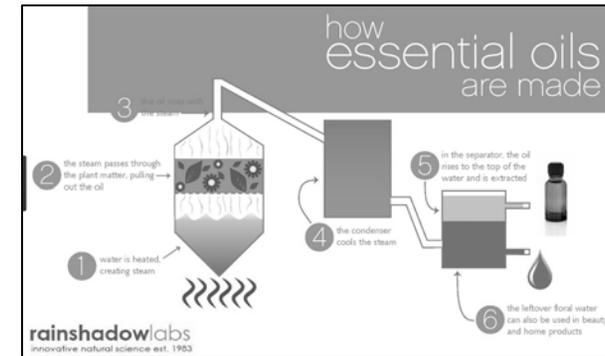
- *Essential oil*: aromatic substance originating from a plant.
- Generally extracted with steam distillation, but also hexane, ether, etc.
- Soluble in alcohol, fatty oils, milk and honey (these are most common).
- Those too delicate to distill usually made into “absolute” with CO2 or solvent (e.g. rose).
- *Hydrosol*: liquid portion of the distillate of an herbal steam distillation. Other names include floral water, herbal water, herbal distillate. Often cloudy because it contains both water soluble compounds and a very small amount of essential oil droplets. Widely used in cosmetics, cooking, baking and medicine.

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Steam Distillation



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Plant Parts Commonly Used

- Leaves: sage, eucalyptus, balm, rosemary, geranium, oregano
- Flowers: rose, jasmine, chamomile, ylang ylang, lavender
- Peels: lemon, orange, grapefruit
- Berries: juniper
- Wood: sandalwood, cedar, fir
- Roots/rhizomes: valerian, ginger, vetiver
- Bark: cinnamon
- Resin: myrrh, frankincense

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Some Safety Reminders

External use of properly diluted essential oils is the safest way to use essential oils. There are only a few exceptions for internal use that I will discuss in this section. Always:

- Dilute essential oils in carrier oil for topical use.
- Beware of photosensitizing effects of citrus oils (e.g, lime, lemon, and bitter orange).
- Keep out of reach of children; keep away from eyes.

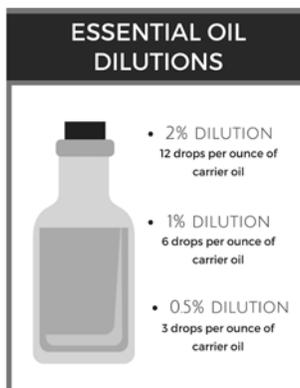
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Essential Oil Use

- Soluble in alcohol, fatty oils, milk and honey (these are most common).
- Face and baby products – generally 0.5%
- Body creams/lotions/oils – generally 1-2%
- Rinse off products (shower gels, soaps) – generally 2-3%



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Aromatherapy Steams



- Eucalyptus: classic anti-viral that soothes the respiratory system and clears nasal passages.
 - Oregano: anti-viral, antioxidant oil helps knock out low-grade sinus infections.
 - Peppermint: one of the best if stuffy nose is giving you a headache.
 - Rosemary: a powerful antiseptic, antiviral and decongestant.
- Put 3-6 drops in pan of water for steam. Do not put face closer than 12 inches to avoid burning the skin.

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Spritzer

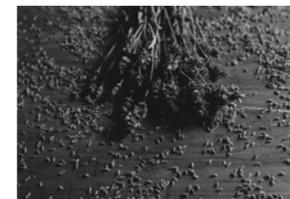
- 2 ounces water
 - 2 ounces vodka
 - Add 2.5 ml (48-50 drops) essential oil
- In 4-ounce glass bottle, mix all ingredients and shake well. Attach mister top and label. Shake well before each use. Do not spray in eyes!
 - Use any essential oil(s): *clary sage* for hot flashes, *citrus* for uplifting, *eucalyptus* cold and flu season, *lavender* for sleep, *rosemary* for clarity, etc.

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Essential Oil Inhalation For Sleep

- Systematic review 11 randomized controlled trials found **majority of studies showed a positive effect of essential oils on sleep.**
- **Lavender most frequently studied** essential oil. No adverse events reported.
- ***Inhalation of essential oils can be used for those with mild sleep disorders.***



Lillehei AS, et al. A systematic review of the effect of inhaled essential oils on sleep. Journal of Alternative and Complementary Medicine 2014; 20(6): <https://doi.org/10.1089/acm.2013.0311>

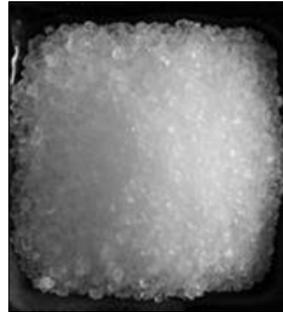
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Herbal Bath

- Balneotherapy great for relaxation, easing muscle tension, improving skin problems.
- Fill bathtub with 6-8 inches water and then add any of following:
 - 1 cup epsoms or dead sea salt
 - 10-15 drops herbal oil infused with essential oil



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Essential Oil Ointments

- Vicks contains **eucalyptus, cedar wood, camphor, and menthol**, widely used for common cold and headache.
- Tiger-Balm contains **peppermint, eucalyptus, clove and cinnamon oils, menthol and camphor**, used for common cold, headache, rheumatic and muscular pains.



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Essential Oil	Potential Use in Dentistry
Lavender	As an anxiolytic in dental office
	Reduces pain of needle insertion, herpes
Eucalyptus	Anticariogenic agent
Peppermint	Antimicrobial activity, halitosis
	Use in oral hygiene products
Cinnamon	In treating oral candidiasis
Lemon	In treating candidiasis
Clove	Antimicrobial against oral pathogens, toothache
Myrrh	Gingivitis, aphthous ulcers, periodontal disease
Tea Tree	Oral candidiasis, aphthous ulcers
	Prophylactic oral hygiene products
	Dagli N, et al. Essential oils, their therapeutic properties, and implication in dentistry, a review. <i>J Int Soc Prev Community Dent</i> 2015; 5(5): 335-340.

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Inhaled Peppermint EO: Nausea



Briggs P et al. Inhaled peppermint oil for postop nausea in patients undergoing cardiac surgery *Nursing* 2016; 46(7): 61-67

- 123 participants post cardiac surgery enrolled in study, **34 experienced nausea and received peppermint inhaler.**
- On scale of 0-5, 5 greatest nausea, average nausea rating before peppermint was **3.29** and after using inhaler once, or 2 minutes later, was **1.44. 19/34 nausea free.**
- **5 patients needed 2nd inhalation. 4/5 nausea free.** One patient required IV antiemetic.
- **Becoming system wide practice as first line intervention.**

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Peppermint: Headache



- **Topical treatment with peppermint essential oil** shown significantly more effective than placebo in controlled studies.
- **Efficacy comparable to aspirin or acetaminophen.** Peppermint oil in ethanol licensed for treatment of tension-type headache in adults and children above 6 years in Germany.

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Peppermint Leaf Essential Oil IBS

- **Meta-analysis RCTs:** soluble fiber, antispasmodic drugs, peppermint oil, and gut-brain neuromodulators for IBS. Most of low risk of bias.
- **Peppermint oil ranked first for efficacy when global symptoms** were used as the outcome measure, and **tricyclic antidepressants** were ranked first for efficacy when **abdominal pain** was used as the outcome measure.
- Dose 0.2 ml taken 2-3 times daily.



Black CJ, et al. *Lancet Gastroenterol Hepatol*. 2019 Dec 16. pii: S2468-1253(19)30324-3.

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Oral Lavender EO (*Lavendula angustifolia*)

- **Meta-analysis** randomized, double-blind, placebo-controlled trials show **Silexan, essential oil from lavender** licensed in 14 countries worldwide, has **pronounced anxiolytic effect and beneficial effect on sleep.** Adverse events similar to placebo.



Moller HJ, et al. Efficacy of Silexan in subthreshold anxiety: meta-analysis of randomised, placebo-controlled trials. *Eur Arch Psychiatry Clin Neurosci* (2017). <https://doi.org/10.1007/s00406-017-0852-4>

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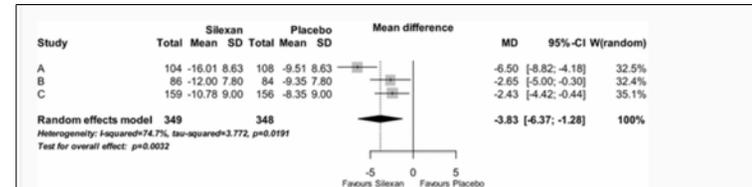


Fig. 1
Hamilton Anxiety Rating Scale total score—change between baseline and treatment end (SD standard deviation, MD mean value difference, CI confidence interval, W weight)

Moller HJ, et al. Efficacy of Silexan in subthreshold anxiety: meta-analysis of randomised, placebo-controlled trials. *Eur Arch Psychiatry Clin Neurosci* (2017). <https://doi.org/10.1007/s00406-017-0852-4>

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Top Resources

- **Natural Medicines Comprehensive Database. *Highly recommend.***
(naturalmedicinesdatabase.com)
- ***American Herbal Products Association's Botanical Safety Handbook*** Provides safety information >500 species of herbs, derived from data compiled from clinical trials, pharmacological and toxicological studies, medical case reports, and historical texts.
- ***Guide to Medicinal Herbs. National Geographic.***
- ***Essential Oil Safety: A Guide for Health Care Professionals*** by Robert Tisserand and Rodney Young. Excellent reference.

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Herbs & Essential Oils: The Good, The Bad, and the Unknown

CE code for this course:

T111

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