Antimicrobial

Herbal oil for otitis media in infancy and childhood; intestinal dysbiosis; in-vitro effects of lamiacea oils; antimicrobial effects of some floral oils; comparison of lavender CO2 from hydrodistillation; lavender for MRSA (2 studies); lavender for cosmetic preservative, differences between lavender flower and leaf oils.

In some studies we learn that natural medicine works better than pharmaceuticals, as in this study that found that lavender ear oil works for otitis media, and that the addition of antibiotics does not improve treatment outcome. We also learn here a nice recipe.

Pediatrics. 2003 May;111(5 Pt 1):e574-9.
Naturopathic treatment for ear pain in children.
Sarrell EM, Cohen HA, Kahan E.
Pediatric and Adolescent Ambulatory Community Clinic of the General Health Services, Sackler Faculty of Medicine, Tel Aviv University, Tel Aviv, Israel.
Comment in:
* J Fam Pract. 2003 Sep;52(9):673, 676.

OBJECTIVE: Otitis media is 1 of the most frequent diseases of early infancy and childhood and 1 of the most common reasons for children to visit a physician. In the past 2 decades, there has been a substantial increase in the diagnosis of otitis media worldwide. In the United States, 93% of all children have had at least 1 episode of acute otitis media (AOM) by 7 years of age. Otalgia is the hallmark of AOM. Most affected children either complain of earache or manifest behavior that the parents interpret as indicating ear pain. Treatment of the ear pain early in the course of AOM decreases both parental anxiety and the child's discomfort and accelerates the healing process. The objective of this study was to determine the efficacy and tolerability of naturopathic versus traditional treatment for the management of otalgia commonly associated with AOM in children. METHODS: The study was designed as a double-blind trial in an outpatient community clinic. A total of 171 children who were aged 5 to 18 years and had otalgia and clinical findings associated with middle-ear infection were studied. The children were randomly assigned to receive treatment with **Naturopathic Herbal Extract Ear Drops (NHED**) or anesthetic ear drops, with or without amoxicillin. On enrollment, the children were assigned by

computer-numbered randomization to receive NHED (contents**: allium sativum, verbascum thapsus, calendula flores, hypericum perfoliatum, lavender, and vitamin E in olive oil) 5 drops 3 times daily**, alone (group A) or together with a topical anesthetic (amethocaine and phenazone in glycerin) 5 drops 3 times daily (group B), or oral amoxicillin 80 mg/kg/d (maximum 500 mg/dose) divided into 3 doses with either NHED 5 drops 3 times daily (group C) or topical anesthetic 5 drops 3 times daily (group D). A double-blind design was used, and all ear drops were placed in identical bottles. Treatment was initiated by the nurse in all cases. A single physician (M.S.) evaluated and treated all of the patients included in the study and recorded all of the data. The presence or absence of ear pain was assessed over 3 days with a visual analog scale. Ear pain was assessed by a specially devised observational instrument based on previous reports. One side of the instrument consisted of a linear numbered scale, from 1 (no pain) to 10 (worst possible pain), and a corresponding color scale, ranging from blue to dark red. The reverse side contained a scale of 5 facial expressions, ranging from broad smile (no pain) to a sad and crying face (worst possible pain), and a corresponding color scale, ranging from blue to dark red. RESULTS: There were no significant between-group differences in patient age or gender, degree of fever, main symptoms, associated symptoms, and severity or laterality of acute otitis media. **Each group had a statistically significant improvement in ear pain over the course of the 3 days. Patients who were given ear drops alone had a better response than patients who were given ear drops together with amoxicillin. Results were better in the NHED group than in the controls. Nevertheless, the findings indicated that the pain was mostly (80%) self-limited and could be explained simply by the time elapsed.** The American Academy of Otolaryngology-Head and Neck Surgery guidelines recommend topical medications as the first line of treatment for ear pain in the absence of systemic infection or serious underlying disease. **Because no evidence was found that systemic antibiotics alone improved treatment outcome, if antibiotics do not change the natural course of otitis media, then the main goal of treatment, as in the present study, should be to alleviate the ear pain. The alternative, naturopathic herbal extract medications, may offer many new possibilities in the management of ear pain associated with AOM.** Primary care physicians should be aware that at least 10% of their patients may have tried 1 or more forms of alternative/complementary medicine before presenting for consultation. As it was widely reported in the medical literature, these herb, these herbal extracts have the potential to meet all of the requirements of appropriate medication that could be routinely used in the pediatric patient, namely in vitro bacteriostatic and bacteriocidal activity against common pathogens, immunostimulation ability, antioxidant activity, and anti-inflammatory effects. They are also well-absorbed with good penetration into the tissue surrounding the tympanic membrane. They have been found to enhance local immunologic activity. Finally, herbal extracts are well-tolerated (owing to their long elimination time), easy to administer, and

less expensive than the new antibiotics. There are no documented side effects. On the basis of our findings that the group with the most significant treatment effects (NHED with topical anesthetic) explained only 7.3% of the total pain reduction, we propose that sometimes the general practitioner or pediatrician needs to give the human body a chance to repair itself. Nevertheless, if the physician believes that there is an indication for some treatment, especially if the parents are anxious, then a local treatment such as one used in our study might be adequate. CONCLUSIONS: **This study suggests that in cases of ear pain caused by AOM in children in which active treatment, besides a simple 2- to 3-day waiting period, is needed, an herbal extract solution may be beneficial. Concomitant antibiotic treatment is apparently not contributory.**

Here is a continuation from our discussion about using aromatic herbs internally for their essential oils for intestinal bacterial ecology.

Altern Med Rev. 2009 Dec;14(4):380-4.
Essential oils in the treatment of intestinal dysbiosis: A preliminary in vitro study.
Hawrelak JA, Cattley T, Myers SP.
School of Health and Human Sciences, Southern Cross University. drjah13@yahoo.com
INTRODUCTION: **Dysbiosis is associated with a number of gastrointestinal and systemic disorders. There is a need for selectively acting antimicrobial agents capable of inhibiting the growth of potentially pathogenic microorganisms, or those found to be out of balance, while not negatively impacting the bulk gastrointestinal tract microflora.** OBJECTIVE: The purpose of this in vitro study is to examine the potential of a selection of essential oils as agents to treat dysbiosis. MATERIALS AND METHODS: Eight essential oils were examined using the agar dilution method, including Carum carvi, Citrus aurantium var. amara, Foeniculum vulgare dulce, Illicium verum, **Lavandula angustifolia,** Mentha arvensis, Mentha x piperita, and Trachyspermum copticum. Doubling dilutions of the essential oils were tested against 12 species of intestinal bacteria, which represent the major genera found in the human gastrointestinal tract (GIT). RESULTS: **Carum carvi, Lavandula angustifolia, Trachyspermum copticum, and Citrus aurantium var. amara essential oils displayed the greatest degree of selectivity, inhibiting the growth of potential pathogens at concentrations that had no effect on the beneficial bacteria examined.** CONCLUSION: The most promising essential oils for the treatment of intestinal dysbiosis are Carum carvi, Lavandula angustifolia, Trachyspermum copticum, and Citrus aurantium var. amara. **The herbs from which these oils are derived have long been used in the treatment of gastrointestinal symptoms and the in vitro results of this study suggest that their ingestion will have little detrimental impact on beneficial members of the GIT microflora**. More research is

needed, however, to investigate tolerability and safety concerns, and verify the selective action of these agents.

We frequently find studies on a specific oil mixed in with studies of other oils, which is an excellent way to discover new species of oils.

J Med Food. 2009 Aug;12(4):902-7.
The in vitro antimicrobial activities of the essential oils of some Lamiaceae species from Turkey.
Sarac N, Ugur A.
Medical Laboratory Program, Vocational School of Health Care, Muğla University, Muğla, Turkey.
In this study, antimicrobial activities of the essential oils obtained by using the hydrodistillation method from some lamiaceous plants--Mentha longifolia (L.) Hudson ssp. longifolia, M. longifolia (L.) Hudson ssp. typhoides (Briq.) Harley var. typhoides, Mentha pulegium L., Salvia fruticosa Miller, Salvia tomentosa Miller, Calamintha nepeta (L.) Savi ssp. glandulosa (Req.) P.W. Ball, Nepeta cadmea Boiss., **Lavandula stoechas** L. ssp. stoechas, and Ziziphora tenuior L.--were determined by using the disc diffusion method. The plants used in this study were collected from different localities of Muğla Province, Turkey. **All the essential oils isolated from the plants were very effective against Gram-positive and Gram-negative bacteria, which included multiple-antibiotic resistant strains,** except Pseudomonas aeruginosa ATCC 27853 and Pseudomonas fluorescens MU 87. **The essential oils of the plant species, except S. tomentosa and S. fruticosa, were very effective against Candida albicans**. The antimicrobial activities varied depending on the species, subspecies, or variety. In fact, **essential oils of some plants belonging to the same taxa but collected from different localities showed different levels of antimicrobial activities.**
Discussion: this reveals the general broad spectrum antimicrobial nature of the oils, as well as the seasonal and geographic differences.

In some studies we find that there are not only numerous species that are yet to be discovered for the antimicrobial benefits, but also numerous species within the same genus, such as Lavendula hybrida. Here we find references to other floral oils with antimicrobial powers, rose and chrysanthemum, as well as confirmation of some of the more powerful oils from the last class.

Arch Pharm Res. 2002 Dec;25(6):860-4.
Antimicrobial activity and chemical composition of some essential oils.
Aridoğan BC, Baydar H, Kaya S, Demirci M, Ozbaşar D, Mumcu E.

Microbiology and Clinical Microbiology Department, Faculty of Medicine, Süleyman Demirel University, Isparta, Turkey. aridogan@sdu.edu.tr
In this study the composition and antimicrobial properties of essential oils obtained from Origanum onites, Mentha piperita, Juniperus exalsa, Chrysanthemum indicum, **Lavandula hybrida**, **Rosa damascena,** Echinophora tenuifolia, Foeniculum vulgare were examined. To evaluate the in vitro antibacterial activities of these eight aromatic extracts; their in vitro antimicrobial activities were determined by disk diffusion testing, according to the NCCLS criteria. Escherichia coli (ATTC 25922), Staphylococcus aureus (ATCC 25923) and Pseudomonas aeruginosa (ATTC 27853 were used as standard test bacterial strains. **Origanum onites recorded antimicrobial activity against all test bacteria, and was strongest against Staphylococcus aureus. For Rosa damascena, Mentha piperita and Lavandula hybrida antimicrobial activity was recorded only to Staphylococcus aureus. Juniperus exalsa, and Chrysanthemum indicum exhibited antibacterial activities against both Staphylococcus aureus and Escherichia coli**. We also examined the in vitro antimicrobial activities of some components of the essential oils and found some components with antimicrobial activity.

Here we find that the extraction method of the oil can be a significant factor in its therapeutic benefits. It compares the antimicrobial effects of lavender from CO2 extract or from typical hydrodistillation. We also learn that lavender has antifungal powers, and we also learn that the results are based on a higher level of a particular compound. We also find out the motivation for this study.

Zhongguo Zhong Yao Za Zhi. 2008 Aug;33(15):1821-4.
Antimicrobial activity and GC-MS analysis of essential oil from lavender extracted by supercritical CO2 extraction and hydrodistillation
[Article in Chinese]
Chen WQ, Jin JZ.
College of Biological and Environmental Engineering, Zhejiang Shuren University, Hangzhou 310015, China. cwq135790@sina.com
OBJECTIVE: **To investigate the antimicrobial activity in vitro and chemical composition of essential oil from lavender extracted by supercritical CO2 extraction (SFE-CO2) process and hydrodistillation.** METHOD: The antimicrobial activities against 4 bacteria and 4 fungi strains of these two oils were evaluated by using the agar disc diffusion and agar dilution method to determine the inhibition zone, minimal inhibitory concentration (MIC) and minimal bactericidal/fungicidal concentration (MBC/MFC). A GC-MS method was established to determine the chemical components of essential oils. RESULT: **These two oils presented remarkable antimicrobial activities against all tested strains in vitro. Compared with the hydrodistillation product, SFE-CO, oil**

showed better antimicrobial activity against either bacteria or fungi of which MIC values were 0.63-3.33 g x L(-1) and the MBC/MFC values were 1.04-5.00 g x L(-1). By GC-MS analysis, 34 and 29 compounds identified cover 95.51% and 98. 39% of total peak area of substances appeared. The main differences between SFE-CO2 oil and hydrodistillation oil were the amounts of linalyl acetate and 5-methyl-2-(1-methylethenyl)-4-hexen-1-ol acetate. CONCLUSION: **Results presented here may suggest that the essential oil of lavender extracted by SFE-CO2 possesses has better antimicrobial properties, and therefore it is a potential source of antimicrobial ingredients for pharmaceutical industry.**

Here we find confirmation that lavender is effective against MRSA. We also learn that combinations of different species of the same oil may enhance its effects. This is the principle behind our blends of eucalyptus, helichrysum, etc.

J Altern Complement Med. 2009 Mar;15(3):275-9.
The antimicrobial activity of high-necrodane and other lavender oils on methicillin-sensitive and -resistant Staphylococcus aureus (MSSA and MRSA).
Roller S, Ernest N, Buckle J.
Faculty of Health and Human Sciences, Thames Valley University, Brentford, UK.
sibel.roller@tvu.ac.uk
OBJECTIVE: **The objective of this study was to compare the antimicrobial efficacy of several lavender oils, used singly and in combination, on methicillin-sensitive and methicillin-resistant Staphylococcus aureus (MSSA and MRSA**). METHODS: Four chemically characterized essential oils from Lavandula angustifolia, L. latifolia, L. stoechas, and a necrodane-rich L. luisieri were assessed for their antibacterial activity using the disc diffusion method. RESULTS: **All four lavender oils inhibited growth of both MSSA and MRSA by direct contact but not in the vapor phase**. Inhibition zones ranged from 8 to 30 mm in diameter at oil doses ranging from 1 to 20 microL, respectively, demonstrating a dose response. At any single dose, the extent of inhibition was very similar irrespective of the chemical composition of the oils or the strain of S. aureus used. Several binary combinations of the oils were tested, and the results showed that the necrodane-rich L. luisieri oil interacted synergistically with L. stoechas (high in 1,8-cineole, fenchone, and camphor) and L. langustifolia (rich in linalool and linalyl acetate) to produce larger inhibition zones than those produced using each oil individually. CONCLUSIONS: **The results suggest that combinations of lavender oils should be investigated further for possible use in antibacterial products.**

Sometimes the studies have very hopeful titles

J Craniomaxillofac Surg. 2009 Oct;37(7):392-7. Epub 2009 May 26.
The battle against multi-resistant strains: Renaissance of antimicrobial essential oils as a promising force to fight hospital-acquired infections.
Warnke PH, Becker ST, Podschun R, Sivananthan S, Springer IN, Russo PA, Wiltfang J, Fickenscher H, Sherry E.
Department of Oral and Maxillofacial Surgery, University of Kiel, Germany.
warnke@mkg.uni-kiel.de
Hospital-acquired infections and antibiotic-resistant bacteria continue to be major health concerns worldwide. Particularly problematic is methicillin-resistant Staphylococcus aureus (MRSA) and its ability to cause severe soft tissue, bone or implant infections. First used by the Australian Aborigines, Tea tree oil and Eucalyptus oil (and several other essential oils) have each demonstrated promising efficacy against several bacteria and have been used clinically against multi-resistant strains. Several common and hospital-acquired bacterial and yeast isolates (6 Staphylococcus strains including MRSA, 4 Streptococcus strains and 3 Candida strains including Candida krusei) were tested for their susceptibility for Eucalyptus, Tea tree, Thyme white, Lavender, Lemon, Lemongrass, Cinnamon, Grapefruit, Clove Bud, Sandalwood, Peppermint, Kunzea and Sage oil with the agar diffusion test. Olive oil, Paraffin oil, Ethanol (70%), Povidone iodine, Chlorhexidine and hydrogen peroxide (H(2)O(2)) served as controls. Large prevailing effective zones of inhibition were observed for Thyme white, Lemon, Lemongrass and Cinnamon oil. The other oils also showed considerable efficacy. Remarkably, almost all tested oils demonstrated efficacy against hospital-acquired isolates and reference strains, whereas Olive and Paraffin oil from the control group produced no inhibition. **As proven in vitro, essential oils represent a cheap and effective antiseptic topical treatment option even for antibiotic-resistant strains as MRSA and antimycotic-resistant Candida species.**

Here we learn that essential oils are being researched for preservative values in cosmetics. This is one of their traditional uses, as the antimicrobial effects translate directly to anti-spoilage from microbes. As we discussed earlier, the anitmicrobial effects of the aromatic plants, especially the spices, were widely used for food preservative purposes. The conclusion of the study also has great implications as far as a new world of natural products replacing toxic ones.

J Appl Microbiol. 2009 Jun 12. [Epub ahead of print]
Antimicrobial activity of lavender, tea tree and lemon oils in cosmetic preservative systems.
Kunicka-Styczyńska A, Sikora M, Kalemba D.

Institute of Fermentation Technology and Microbiology, Technical University of Lodz, Lodz, Poland.
Aims: The aim of the study was to verify the antimicrobial activity of commercial essential oils: lavender, tea tree and lemon as the components of a preservative system in oil in water body milks. Methods and Results: The inhibition efficacy of essential oils alone (0.5%), in mixtures (1%) as well as combined with the synthetic preservative 1,3-dimethylol-5,5-dimethylhydantoin and a 3-iodo-2-propynyl butyl carbamate mixture (0.1% and 0.2%) was tested against Staphylococcus aureus ATCC 6538, Pseudomonas aeruginosa ATCC 9027, Candida sp. ŁOCK 0008 and Aspergillus niger ATCC 16404 in compliance with the standards of the European Pharmacopoeia Commission. The in vitro activity of oils determined by an impedimetric method was also compared with their activity in cosmetic preparations. Criterion A for bacteria (reduction in the inoculum by 3 logarithmic units within 7 days with no increase up to the 28th day) and fungi (reduction in the inoculum by 2 logarithmic units within 14 days with no increase up to the 28th day) was fulfilled for cosmetic formulations containing the tested essential oils with 0.2% of the synthetic preservative. The preservative concentration could be decreased to 0.1% (with preserving the same efficacy) in combination with lavender and tea tree oils at a concentration of 0.5% each. **Conclusions: In all combinations of essential oils with the synthetic preservative, a synergistic effect of the preservative system components was observed, which made it possible to reduce the usable level of the synthetic preservative up to 8.5 times. Significance and Impact of the Study: To develop an effective preservative system in cosmetics in which a synthetic chemical preservative is replaced by natural essential oils.**
Discussion: We find many references of the antimicrobial effects of oils in studies related to food preservation and spoilage.

Here we find a study that examines the antimicrobial effects of the oil from the flower vs the oil from the leaf. We also learn of a new species of lavender oil which we should start stocking soon.

Nat Prod Commun. 2009 Jul;4(7):1001-6.
Chemical composition and antimicrobial activity of the essential oils of Lavandula stoechas L. ssp. stoechas growing wild in Turkey.
Kirmizibekmez H, Demirci B, Yeşilada E, Başer KH, Demirci F.
Department of Pharmacognosy, Faculty of Pharmacy, Yeditepe University, TR-34755, Kayişdağı, Istanbul, Turkey.
The chemical compositions of the essential oils obtained by hydrodistillation from the dried leaves and flowers of Lavandula stoechas L. ssp. stoechas were separately identified by GC-FID and GC-MS analyses. The main components were alpha-fenchone

(41.9 +/- 1.2%), 1,8-cineole (15.6 +/- 0.8%), camphor (12.1 +/- 0.5%), and viridiflorol (4.1 +/- 0.4%) in the leaves; and alpha-fenchone (39.2 +/- 0.9%), myrtenyl acetate (9.5 +/- 0.4%), alpha-pinene (6.1 +/- 0.09%), camphor (5.9 +/- 0.05%) and 1,8-cineole (3.8 +/- 0.1%) in the flowers. Overall, 55 and 66 constituents were identified in the leaf and flower essential oils representing more than 90% and 94% of the total, respectively. **In addition, the essential oils were evaluated for their antibacterial and anticandidal activities** by broth microdilution. **The flower essential oil was found to be relatively more active than the leaf oil towards the tested pathogenic microorganisms. Methicillin-resistant Staphylococcus aureus was more susceptible to the flower oil** (MIC = 31.2 microg/mL). The oils, evaluated for their free radical scavenging activity using a TLC-DPPH assay, were inactive at a concentration of 2 mg/mL.
Discussion: I have been assuming that the oils that we have are from the flowers only, but I do not have actual confirmation of that. I have written to our distillers with that specific question.

Anxiety
Anxiety and pain in ICU, effect on chronic hemodialysis patients, , pain, anxiety and sense of well being in cancer hospice patients; effect on mood and math computations,

J Adv Nurs. 1995 Jan;21(1):34-40.
Sensing an improvement: an experimental study to evaluate the use of aromatherapy, massage and periods of rest in an intensive care unit.
Dunn C, Sleep J, Collett D.
Royal Bershire Hospital NHS Trust, Reading, England.
There is widespread belief that the use of aromatherapy and massage in an intensive care environment offers a means of increasing the quality of sensory input that patients receive, as well as reducing levels of stress and anxiety. Despite a wealth of anecdotal evidence in support of these claims, there have been few objective studies to evaluate the effects of these therapies. In this experimental study **122 patients admitted to a general intensive care unit** were randomly allocated to receive either massage, aromatherapy using essential oil of lavender, or a period of rest. Both pre- and post-therapy assessments included physiological stress indicators and patients' evaluation of their anxiety levels, mood and ability to cope with their intensive care experience. Ninety-three patients (77%) were able to complete subjective assessments. **There were no statistically significant differences in the physiological stress indicators** or observed or reported behaviour of patients' ability to cope following any of the three interventions. **However, those patients who received aromatherapy reported significantly greater improvement in their**

mood and perceived levels of anxiety. They also felt less anxious and more positive immediately following the therapy, although this effect was not sustained or cumulative.
Discussion: it appears that aromatherapy here means no massage. Either way, it indicates that lavender should be used in ICU

Here we learn about a new oil tat is potentially useful for treating depression, which is Hiba oil, which significantly decreased the levels of depression. We also learn that lavender aroma significantly decreased the levels of anxiety.

Psychiatry Clin Neurosci. 2000 Aug;54(4):393-7.
Psychological effects of aromatherapy on chronic hemodialysis patients.
Itai T, Amayasu H, Kuribayashi M, Kawamura N, Okada M, Momose A, Tateyama T, Narumi K, Uematsu W, Kaneko S.
Department of Neurophsychiatry, Hirosaki University Hospital, Japan.
Comment in:
* Ky Nurse. 2005 Jul-Sep;53(3):23.
Effects of aromatherapy (odorless condition, lavender, and hiba oil) on mood and anxiety were investigated in **14 female** patients who were being treated with chronic hemodialysis. **A control period consisting of natural hospital smells was established before each test session,** (**natural hospital smells??)** and then aromatic test conditions were systematically evaluated for odorless conditions as well as aromatic conditions containing lavender and hiba oil aromas. The effects of aromatherapy were measured using the Hamilton rating scale for depression (HAMD) and the Hamilton rating scale for anxiety (HAMA). Hiba oil aroma significantly decreased the mean scores of HAMD and HAMA, and lavender aroma significantly decreased the mean scores of HAMA. The mean scores of HAMD and HAMA in an odorless condition were not significantly different from those of the control conditions. **These results indicate that in chronic hemodialysis patients hiba oil is an effective, non-invasive means for the treatment of depression and anxiety, and that lavender alleviates anxiety.**

Here we learn that cancer patients in hospice respond well to lavender.

Am J Hosp Palliat Care. 2002 Nov-Dec;19(6):381-6.
Use of aromatherapy with hospice patients to decrease pain, anxiety, and depression and to promote an increased sense of well-being.
Louis M, Kowalski SD.
Department of Nursing, University of Nevada, Las Vegas, USA.

This study measured the responses of **17 cancer hospice patients** to **humidified essential lavender oil aromatherapy.** Vital signs as well as levels of pain, anxiety, depression, and sense of well-being were measured (using 11-point verbal analogs). Each subject was measured on three different days before and after a 60-minute session consisting of (1) no treatment (control); (2) water humidification (control); or (3) 3-percent lavender aromatherapy. **Results reflected a positive, yet small, change in blood pressure and pulse, pain, anxiety, depression, and sense of well-being after both the humidified water treatment and the lavender treatment.** Following the control session (no treatment), there was also slight improvement in vital signs, depression, and sense of well-being, but not in pain or anxiety levels.

Here is another study of cancer patients in hospice with different results.

Palliat Med. 2004 Mar;18(2):87-92.
A randomized controlled trial of aromatherapy massage in a hospice setting.
Soden K, Vincent K, Craske S, Lucas C, Ashley S.
Princess Alice Hospice, Esher, Surrey, UK. pkteash@hotmail.com
Research suggests that patients with cancer, particularly in the palliative care setting, are increasingly using aromatherapy and massage. **There is good evidence that these therapies may be helpful for anxiety reduction for short periods, but few studies have looked at the longer term effects.** This study was designed to compare the effects of four-week courses of aromatherapy massage and massage alone on physical and psychological symptoms in patients with advanced cancer. Forty-two patients were randomly allocated to receive weekly massages with lavender essential oil and an inert carrier oil (aromatherapy group), an inert carrier oil only (massage group) or no intervention. Outcome measures included a Visual Analogue Scale (VAS) of pain intensity, the Verran and Snyder-Halpern (VSH) sleep scale, the Hospital Anxiety and Depression (HAD) scale and the Rotterdam Symptom Checklist (RSCL). **We were unable to demonstrate any significant long-term benefits of aromatherapy or massage in terms of improving pain control, anxiety or quality of life. However, sleep scores improved significantly in both the massage and the combined massage (aromatherapy and massage) groups. There were also statistically significant reductions in depression scores in the massage group. In this study of patients with advanced cancer, the addition of lavender essential oil did not appear to increase the beneficial effects of massage. Our results do suggest, however, that patients with high levels of psychological distress respond best to these therapies.**

Here is another study of lavender on cancer patients in hospice, with different results. This one also gives us a recipe.

Taehan Kanho Hakhoe Chi. 2008 Aug;38(4):493-502.
[Effects of aroma hand massage on pain, state anxiety and depression in hospice patients with terminal cancer]
[Article in Korean]
Chang SY.
Department of Nursing, Keimyung University, Jung-gu, Daegu, Korea. so726@kmu.ac.kr
PURPOSE: The purpose of this study was to examine the effects of **aroma hand massage on pain, state anxiety and depression in hospice patients with terminal cancer.**
METHODS: This study was a nonequivalent control group pretest-posttest design. The subjects were 58 hospice patients with terminal cancer who were hospitalized. Twenty eight hospice patients with terminal cancer were assigned to the experimental group (aroma hand massage), and 30 hospice patients with terminal cancer were assigned to the control group (general oil hand massage). As for the experimental treatment, the experimental group went through **aroma hand massage on each hand for 5 min for 7 days with blended oil-a mixture of Bergamot, Lavender, and Frankincense in the ratio of 1:1:1, which was diluted 1.5% with sweet almond carrier oil 50 ml.** The control group went through general oil hand massage by only sweet almond carrier oil-on each hand for 5 min for 7 days. **RESULTS: The aroma hand massage experimental group showed more significant differences in the changes of pain score (t=-3.52, p=.001) and depression (t=-8.99, p=.000) than the control group. CONCLUSION: Aroma hand massage had a positive effect on pain and depression in hospice patients with terminal cancer.**

Here we learn tat if you get a massage with lavender once a week for six weeks that six out of eight subjects' will have improvement in their Hospital Anxiety and Depression Scale results.

Complement Ther Nurs Midwifery. 2003 May;9(2):90-7.
A pilot study addressing the effect of aromatherapy massage on mood, anxiety and relaxation in adult mental health.
Edge J.
Lavender Day Hospital, Horsham (Formerly Sussex Weald and Downs NHS Trust), West Sussex Health and Social Care NHS Trust, UK. Ja_edge@hotmail.com
This study was carried out **with eight subjects specifically referred for aromatherapy; each received a standardised aromatherapy massage weekly for 6 weeks**. The subjects' levels of anxiety and depression were measured using the Hospital Anxiety and Depression (HAD) Scale prior to the first massage and after the final massage. The subjects' levels of mood, anxiety and relaxation were recorded using a visual analogue before and

after each massage and then again 6 weeks after the last massage. Comparison was made between the HAD Scale results for each client and also the visual analogue scale results for before and after massage and also first massage and 6 weeks postmassage for the sample group. Improvements were shown in six out of eight subjects' HAD Scale results. Improvements were also shown in all areas when comparing the visual analogue scale results. The study was carried out over an 8-month period. To date there have been few studies addressing the effect of aromatherapy massage on mood, anxiety and relaxation (Therapist 9 (1996) 38). It is acknowledged that there may be a number of reasons for this such as factors related to obtaining a sample group, informed consent, the interaction of current medication regimes and so forth. It is acknowledged that whilst this is a small pilot study a number of methodological issues are raised concerning research into the use of aromatherapy in this clinical field. By reporting on this work, it is hoped that this paper will generate reflection, discussion and debate so forwarding the knowledge base in this discipline.

Here is a nice study about stress reduction in nursing students, with a nice recommendation at the end.

Taehan Kanho Hakhoe Chi. 2004 Apr;34(2):344-51.
[The effect of aroma inhalation method on stress responses of nursing students]
[Article in Korean]
Park MK, Lee ES.
Department of Nursing, Nambu University, Gwangsan-gu, Gwangju city, Korea.
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PURPOSE: The purpose of this study is to identify the effect of aroma inhalation on stress responses (physical symptoms, levels of anxiety, perceived stresses)of nursing students.
METHOD: This study was a quasi-experimental research using a non-equivalent pre-post design and was conducted from June 1 to June 5, 2002. The subjects consisted of **77 junior nursing students** who were divided into 39 experimental group members and 38 control group members. A pretest and Post-test were conducted to measure body symptoms, the level of anxiety, and the level of perceived stress. In the experimental group, aromas were given using an **aroma lamp, lavender, peppermint, rosemary and Clary-Sage**. In the control group, the treatment was not administered. RESULT: **As a result of administering aroma inhalation to nursing students, their physical symptoms decreased, their anxiety scores were low, and their perceived stress scores were low, showing that aroma inhalation could be a very effective stress management method. CONCLUSION: Nursing educators should play an important role in contributing to college students' physical and psychological health by helping enhance their recognition of stress management and effectively relieving their stress using essential oils.**

Here we learn that lavender can be useful for students.

Int J Neurosci. 1998 Dec;96(3-4):217-24.
Aromatherapy positively affects mood, EEG patterns of alertness and math computations.
Diego MA, Jones NA, Field T, Hernandez-Reif M, Schanberg S, Kuhn C, McAdam V, Galamaga R, Galamaga M.
University of Miami School of Medicine, USA.
EEG activity, alertness, and mood were assessed in 40 adults given **3 minutes of aromatherapy using two aromas, lavender (considered a relaxing odor) or rosemary (considered a stimulating odor).** Participants were also given simple math computations before and after the therapy. The **lavender group** showed increased beta power, **suggesting increased drowsiness, they had less depressed mood (POMS) and reported feeling more relaxed and performed the math computations faster and more accurately following aromatherapy. The rosemary group, on the other hand, showed decreased frontal alpha and beta power, suggesting increased alertness. They also had lower state anxiety scores, reported feeling more relaxed and alert and they were only faster, not more accurate, at completing the math computations after the aromatherapy session.**

Another study for students.

Holist Nurs Pract. 2009 Mar-Apr;23(2):88-93.
The effects of lavender and rosemary essential oils on test-taking anxiety among graduate nursing students.
McCaffrey R, Thomas DJ, Kinzelman AO.
Christine E Lynn **College of Nursing, Florida Atlantic University**, 777 Glades Road, Boca Raton, FL 33431, USA. rmccaffr@fau.edu
Test taking in nursing school can produce stress that affects the ability of students to realize their goals of graduation. **In this study, the use of lavender and rosemary essential oil sachets reduced test-taking stress in graduate nursing students as evidenced by lower scores on test anxiety measure, personal statements, and pulse rates.**
Discussion: fragrance as pneumonic device

Sometimes we find fascinating results of difference tests, if only we could understand what the writer was talking about.

Psychol Rep. 2004 Oct;95(2):707-22.
Scent and mood state following an anxiety-provoking task.
Burnett KM, Solterbeck LA, Strapp CM.
Psychology Division, Western Oregon University, Monmouth, OR 97361, USA.
The purpose of this study was to assess the effects of water, lavender, or rosemary scent on physiology and mood state following an anxiety-provoking task. The nonsmoking participants, ages 18-30 years, included 42 women and 31 men who reported demographic information and measures of external temperature and heart rate were taken prior to introduction of an anxiety-eliciting task and exposure to lavender, rosemary, or water scents. Following the task, participants completed the Profile of Mood States to assess mood, and temperature and heart rate were reassessed. Participants rated the pleasantness of the scent received. When pleasantness ratings of scent were covaried, physiological changes in temperature and heart rate did not differ based on scent exposure, but mood ratings differed by scent condition. **Participants in the rosemary condition scored higher on measures of tension-anxiety and confusion-bewilderment relative to the lavender and control conditions. The lavender and control conditions showed higher mean vigor-activity ratings relative to the rosemary group, while both rosemary and lavender scents were associated with lower mean ratings on the fatigue-inertia subscale, relative to the control group. These results suggest that, when individual perception of scent pleasantness is controlled, scent has the potential to moderate different aspects of mood following an anxiety-provoking task.**

Here is an example of how your tax dollars are being spent.

Int J Neurosci. 2005 Feb;115(2):207-22.
Lavender fragrance cleansing gel effects on relaxation.
Field T, Diego M, Hernandez-Reif M, Cisneros W, Feijo L, Vera Y, Gil K, Grina D, Claire He Q.
Touch Research Institutes, University of Miami School of Medicine, Miami, Florida 33101, USA. tfield@med.miami.edu
Alertness, mood, and math computations were assessed in 11 healthy adults who sniffed a cosmetic cleansing gel with lavender floral blend aroma, developed to be relaxing using Mood Mapping. EEG patterns and heart rate were also recorded before, during, and after the aroma session. **The lavender fragrance blend had a significant transient effect of improving mood, making people feel more relaxed, and performing the math computation faster**. The self-report and physiological data are consistent with relaxation profiles during other sensory stimuli such as massage and music, as reported in the literature. **The data suggest that a specific cosmetic fragrance can have a significant role in enhancing relaxation.**

Here is the study that I mentioned last week, referring specifically to the citrus oils.

Physiol Behav. 2005 Sep 15;86(1-2):92-5.
Ambient odors of orange and lavender reduce anxiety and improve mood in a dental office.
Lehrner J, Marwinski G, Lehr S, Johren P, Deecke L.
University Clinic of Neurology, Medical University of Vienna, Austria.
johann.lehrner@meduniwien.ac.at
The goal of this study was to investigate the impact of the essential oils of orange and lavender on anxiety, mood, alertness and calmness in dental patients. **Two hundred patients between the ages of 18 and 77 years (half women, half men**) were assigned to one of four independent groups. While waiting for dental procedures patients were either stimulated with ambient odor of orange or ambient odor of lavender. These conditions were compared to a music condition and a control condition (no odor, no music). Anxiety, mood, alertness and calmness were assessed while patients waited for dental treatment. **Statistical analyses revealed that compared to control condition both ambient odors of orange and lavender reduced anxiety and improved mood in patients waiting for dental treatment.** These findings support the previous opinion that odors are capable of altering emotional states and may indicate that the use of odors is helpful in reducing anxiety in dental patients.

Here is another study about dental stress, where we learn that lavender reduces anxiety in dental patients who are waiting for treatment, but does not reduce anxiety about dental work in general.

Community Dent Oral Epidemiol. 2010 Feb;38(1):83-7. Epub 2009 Nov 23.
The effects of lavender scent on dental patient anxiety levels: a cluster randomised-controlled trial.
Kritsidima M, Newton T, Asimakopoulou K.
King's College London, Dental Institute, Denmark Hill, London, UK.
OBJECTIVES: To review the effect of lavender scent on anticipatory anxiety in dental participants. METHODS: In a cluster randomized-controlled trial, patients' (N = 340) anxiety was assessed while waiting for a scheduled dental appointment, either under the odor of lavender or with no odor. Current anxiety, assessed by the brief State Trait Anxiety Indicator (STAI-6), and generalized dental anxiety, assessed by the Modified Dental Anxiety Scale (MDAS) were examined. RESULTS: Analyses of variance (anovas) showed that although both groups showed similar, moderate levels of generalized dental anxiety (MDAS $F((1,338)) = 2.17$, $P > 0.05$) the lavender group reported significantly lower current anxiety (STAI: $F((1,338)) = 74.69$, $P < 0.001$) than the control group. CONCLUSIONS: **Although**

anxiety about future dental visits seems to be unaffected, lavender scent reduces state anxiety in dental patients.

Here is an excellent and important study from Japan. It seems that a lot of positive research in aromatherapy is coming from Japan and Korea.

J Midwifery Womens Health. 2006 Mar-Apr;51(2):e21-7.
The psychological effects of aromatherapy-massage in healthy postpartum mothers.
Imura M, Misao H, Ushijima H.
Department of Developmental Medical Sciences, Graduate School of Medicine, The University of Tokyo, 7-3-1, Hongoh, Bunkyo-ku, Tokyo 113-0033, Japan.
This study examined the effect of aromatherapy-massage in healthy postpartum mothers. A quasi-experimental between-groups design was used. Mothers who received aromatherapy-massage were compared with a control group who received standard postpartum care. Thirty-six healthy, first-time mothers with vaginal delivery of a full-term, healthy infant participated in this study. Sixteen mothers received a 30-minute aromatherapy-massage on the second postpartum day; 20 mothers were in the control group. All mothers completed the following four standardized questionnaires before and after the intervention: 1) Maternity Blues Scale; 2) State-Trait Anxiety Inventory; 3) Profile of Mood States (POMS); and 4) Feeling toward Baby Scale. In the aromatherapy-massage group, posttreatment scores significantly decreased for the Maternity Blues Scale, the State-Anxiety Inventory, and all but one of the Profile of Mood States subscales. Posttreatment scores in the intervention group significantly increased in Profile of Mood States-Vigor subscale and the Approach Feeling toward Baby subscale. Scores in the intervention group significantly decreased in Conflict Index of Avoidance/Approach Feeling toward Baby subscale. **Our results suggest that aromatherapy-massage might be an effective intervention for postpartum mothers to improve physical and mental status and to facilitate mother-infant interaction.**
Discussion: Specifically, it was found maternity blues scale went down, anxiety scale went down, moodiness scale went down, and feeling toward baby scale went up.

Here is another study from Korea with important implications.

Int J Neurosci. 2006 Dec;116(12):1447-55.
Effects of aromatherapy massage on anxiety and self-esteem in korean elderly women: a pilot study.
Rho KH, Han SH, Kim KS, Lee MS.
Research Institute of Nursing Science, College of Nursing Seoul National University, Seoul, South Korea.

This study investigated the effects of aromatherapy massage on the anxiety and self-esteem experienced by Korean elderly women. A quasi-experimental, control group, pretest-posttest design was used. The subjects comprised **36 elderly females**: 16 in the experimental group and 20 in the control group. Aromatherapy massage using **lavender, chamomile, rosemary, and lemon** was given to the experimental group only. Each massage session lasted **20 min, and was performed 3 times per week for two 3-week periods with an intervening 1-week break**. **The intervention produced significant differences in the anxiety and self-esteem** and no significant differences in blood pressure or pulse rate between the two groups. **These results suggest that aromatherapy massage exerts positive effects on anxiety and self-esteem**. However, more objective, clinical measures should be applied in a future study with a randomized placebo-controlled design.

Here is a study that shows us an innovative and important way to deliver essential oils. It is also significant where the study was done.

Pain Pract. 2006 Dec;6(4):273-7.
Evaluation of aromatherapy in treating postoperative pain: pilot study.
Kim JT, Wajda M, Cuff G, Serota D, Schlame M, Axelrod DM, Guth AA, Bekker AY.
Department of Anesthesiology, New York University Medical Center, New York 10016, USA. jung.kim@med.nyu.edu
Comment in:
* Pain Pract. 2007 Sep;7(3):288-9.
This study compared the **analgesic efficacy of postoperative lavender oil aromatherapy in 50 patients undergoing breast biopsy surgery. Twenty-five patients received supplemental oxygen through a face mask with two drops of 2% lavender oil postoperatively**. The remainder of the patients received supplemental oxygen through a face mask with no lavender oil. Outcome variables included pain scores (a numeric rating scale from 0 to 10) at 5, 30, and 60 minutes postoperatively, narcotic requirements in the postanesthesia care unit (PACU), patient satisfaction with pain control, as well as time to discharge from the PACU. **There were no significant differences in narcotic requirements and recovery room discharge times between the two groups. Postoperative lavender oil aromatherapy did not significantly affect pain scores. However, patients in the lavender group reported a higher satisfaction rate with pain control than patients in the control group** ($P = 0.0001$).
Discussion: this is a fascinating discovery, because it shows that lavender does not actually reduce pain, but it reduces suffering.

Another study of lavender in a surgical setting, this time before procedures.

Gastroenterol Nurs. 2006 Nov-Dec;29(6):466-71.
Aromatherapy and reducing preprocedural anxiety: A controlled prospective study.
Muzzarelli L, Force M, Sebold M.
Delnor-Community Hospital, Geneva, **Illinois** 60134, USA. lorie.muzzarelli@delnor.com
The purpose of this study was to evaluate the use of **aromatherapy to reduce anxiety prior to a scheduled colonoscopy or esophagogastroduodenoscopy**. A controlled, prospective study was done on a convenience sample of **118 patients**. The "state" component of the State Trait Anxiety Inventory (STAI) was used to evaluate patients' anxiety levels pre- and postaromatherapy. The control group was given an inert oil (placebo) for inhalation, and the experimental group was given the essential oil, lavender, for inhalation. The STAI state anxiety raw score revealed that patients were at the 99th (women) and 96th (men) percentiles for anxiety. The intervention group and the control group had similar levels of state anxiety prior to the beginning of the study (t[116] = .47, p = .64). There was no difference in state anxiety levels between pre- and postplacebo inhalation in the control group (t[112] = .48, p = .63). There was no statistical difference in state anxiety levels between pre- and postlavender inhalation in the experimental group (t[120] = .73, p = .47). **Although this study did not show aromatherapy to be effective based on statistical analysis, patients did generally report the lavender scent to be pleasant. Lavender is an inexpensive and popular technique for relaxation that can be offered to patients as an opportunity to promote preprocedural stress reduction in a hospital setting.**

Here is another study done on reducing anxiety before medical procedures. We learn another interesting acronym, and we also get to enjoy some amusing ways of using the English language.

Gastroenterol Nurs. 2008 Nov-Dec;31(6):395-9.
The use of nonpharmacological interventions to reduce anxiety in patients undergoing gastroscopy in a setting with an optimal soothing environment.
Hoya Y, Matsumura I, Fujita T, Yanaga K.
Digestive Endoscopy Service, Kumagaya Geka Hospital, Kumagaya, **Japan.** hoya@jikei.ac.jp
Patients develop anxiety before undergoing gastroscopy. By removing such distressing feelings, patients are more likely to experience gastroscopy more smoothly. This study was designed to examine changes in anxiety levels in patients undergoing gastroscopy and the effect of an optimal soothing environment (OSE) as a new nonpharmacological intervention to reduce patient anxiety prior to gastroscopy. During a 6-month period, 50 outpatients referred for gastroscopy were randomly assigned to two groups (control group, n = 24 patients; OSE group, n = 26

patients). This study was performed at the digestive endoscopy service of a 150-bed acute care hospital in Japan. The patient anxiety was assessed using the Face Scale score. Pre- and postprocedural systolic blood pressures were measured and values were compared with blood pressure upon arrival at the hospital. The tools for an OSE, including a safe essential oil burner with lavender essential oil and a digital video disk program entitled "Flow" manufactured by NHK (Japan Broadcasting Corporation) software, were provided to patients in the waiting room before gastroscopy. The score for self-assessed anxiety level just before gastroscopy was significantly higher than that on arrival at the hospital but returned to baseline after gastroscopy in the control group, whereas the score did not increase before starting gastroscopy in the OSE group. Systolic blood pressure measurements just before and after gastroscopy were significantly higher than those on arrival at the hospital and the baseline values in the control group, whereas it was not increased before starting gastroscopy in the OSE group. **Providing an OSE before and during gastroscopy is useful to minimize patient anxiety regarding experiencing a gastroscopy. This nonpharmacological method is a simple, inexpensive, and safe method of minimizing anxiety before and during gastroscopy.**

Here is a very important study. We see again that there is a lot of interest in Asia for this subject. This is also a specific remedy and combination of oils.

Taehan Kanho Hakhoe Chi. 2006 Dec;36(7):1123-34.
[The effects of the inhalation method using essential oils on blood pressure and stress responses of clients with essential hypertension]
[Article in Korean]
Hwang JH.
Department of Nursing, Geochang Provincial College, Geochang-gun, Gyungnam, Korea. jhhwang@kc.ac.kr
PURPOSE: The purpose of this study was to identify the effects of aromatherapy on blood pressure and stress responses of clients with essential hypertension. METHOD: There were **fifty-two subjects divided into an essential oil group, placebo group, and control group by random assignment**. **The application of aromatherapy was the inhalation method of blending oils with lavender, ylangylang, and bergamot once daily for 4 weeks. To evaluate the effects of aromatherapy, blood pressure and pulse were measured two times a week and serum cortisol levels, catecholamine levels, subjective stress, and state anxiety were measured before and after treatment in the three groups.** Data was analyzed by repeated measures of ANOVA, one-way ANOVA, and chi(2)-test using the SPSS 10.0 program. **RESULTS: The blood pressure, pulse, subjective stress, state anxiety, and serum cortisol levels** among the three groups were significantly statistically different. The differences of catecholamine among the three

groups were not significant statistically. **CONCLUSION: The results suggest that the inhalation method using essential oils can be considered an effective nursing intervention that reduces psychological stress responses and serum cortisol levels, as well as the blood pressure of clients with essential hypertension.**

The antianxiety effects of lavender or not just good for humans, but also for Mongolian gerbils.

J Ethnopharmacol. 2007 May 22;111(3):517-25. Epub 2006 Dec 27.
Anxiolytic effects of Lavandula angustifolia odour on the Mongolian gerbil elevated plus maze.
Bradley BF, Starkey NJ, Brown SL, Lea RW.
Department of Psychology, University of Central Lancashire, Preston, Lancashire, UK. bfhornby@uclan.ac.uk
Lavender is a popular treatment for stress and mild anxiety in Europe and the USA. The present study investigated the effects of (Lavandula angustifolia Mill. (Lamiaceae)) lavender odour inhalation over 2 weeks or 24 h periods, on gerbil behaviour in the elevated plus maze in mature male and female gerbils, and compared results with the effects of diazepam (1 mg/kg) i.p. after 30 min and 2-week administration. Traditional measures of open entries showed an increasing trend over the 2 weeks exposure, whereas ethological measures indicative of anxiety; stretch-attend frequency and percentage protected head-dips, were significantly lower. Exploratory behaviour, total head-dip frequency, increased after 24 h lavender and 2 weeks exposure. These results are comparable with diazepam administration. There were sex differences in protected head-dip an ethological indicator of anxiety: females showed a significant decrease in protected head-dips compared to both males and to female controls. In conclusion **exposure to lavender odour may have an anxiolytic profile in gerbils similar to that of the anxiolytic diazepam. In addition, prolonged, 2-week lavender odour exposure increased exploratory behaviour in females indicating a further decrease in anxiety in this sex.**
Discussion: so, if you are a female gerbil and would like to increase your exploratory behavior, lavender is a good oil to use.

One the other hand, if you are a rat you would like to know this one:

Phytomedicine. 2007 Sep;14(9):613-20. Epub 2007 May 4.
Anxiolytic effects of lavender oil inhalation on open-field behaviour in rats.
Shaw D, Annett JM, Doherty B, Leslie JC.
School of Psychology, University of Ulster, Coleraine, Northern Ireland BT52 1SA, UK.

To establish a valid animal model of the effects of olfactory stimuli on anxiety, a series of experiments was conducted using rats in an open-field test. Throughout, effects of lavender oil were compared with the effects of chlordiazepoxide (CDP), as a reference anxiolytic with well-known effects on open-field behaviour. Rats were exposed to lavender oil (0.1-1.0 ml) for 30 min (Experiment 1) or 1h (Experiment 2) prior to open-field test and in the open field or injected with CDP (10 mg/kg i.p.). CDP had predicted effects on behaviour, and the higher doses of lavender oil had some effects on behaviour similar to those of CDP. In Experiment 3, various combinations of pre-exposure times and amounts of lavender oil were used. With sufficient exposure time and quantity of lavender the same effects were obtained as in Experiment 2. Experiment 4 demonstrated that these behavioural effects of lavender could be obtained following pre-exposure, even if no oil was present in the open-field test. In Experiments 2-4, lavender oil increased immobility. **Together, these experiments suggest that lavender oil does have anxiolytic effects in the open field, but that a sedative effect can also occur at the highest doses.**

Here is a result about the anti conflict effect of lavender on mice. Whenever I read these kinds of studies I always think of the benefits aromatherapy could have on the rat race.

Pharmacol Biochem Behav. 2006 Dec;85(4):713-21. Epub 2006 Dec 14.
Anticonflict effects of lavender oil and identification of its active constituents.
Umezu T, Nagano K, Ito H, Kosakai K, Sakaniwa M, Morita M.
Environmental Chemistry Division, National Institute for Environmental Studies, 16-2 Onogawa, Tsukuba, Ibaraki 305-0053, Japan. umechan2@nies.go.jp
The pharmacological effects of lavender oil were investigated using two conflict tests in ICR mice, and then the active constituents were identified. **Lavender oil produced significant anticonflict effects at 800 and 1600 mg/kg in the Geller conflict test and at 800 mg/kg in the Vogel conflict test, suggesting that the oil has an anti-anxiety effect.** Analysis using GC/MS revealed that lavender oil contains 26 constituents, among which alpha-pinene (ratio, 0.22%), camphene (0.06%), beta-myrcene (5.33%), p-cymene (0.3%), limonene (1.06%), cineol (0.51%), linalool (26.12%), borneol (1.21%), terpinene-4-ol (4.64%), linalyl acetate (26.32%), geranyl acetate (2.14%) and caryophyllene (7.55%) were identified. We examined the effects of linalool, linalyl acetate, borneol, camphene, cineol, terpinen-4-ol, alpha-pinene and beta-myrcene using the Geller and Vogel conflict tests in ICR mice. Cineol, terpinen-4-ol, alpha-pinene and beta-myrcene did not produce any significant anticonflict effects in the Geller test. Linalyl acetate did not produce any significant anticonflict effects in either test. Both borneol and camphene at 800 mg/kg produced significant anticonflict effects in the Geller, but not in the Vogel conflict test. Linalool, a major constituent of lavender oil, produced significant anticonflict effects at 600 and 400 mg/kg in the Geller and Vogel tests, respectively, findings that were similar to

those of lavender oil. Thus, **we concluded that linalool is the major pharmacologically active constituent involved in the anti-anxiety effect of lavender oil.**
Discussion: not sure what anti-conflict rests for mice are, but apparently it is some stressful situation that induces anxiety.

Sometimes we can find studies that are obviously paid for by the pharmaceutical companies trying to discredit aromatherapy.

Br J Health Psychol. 2008 Nov;13(Pt 4):603-17. Epub 2007 Sep 7.
Expectancies, not aroma, explain impact of lavender aromatherapy on psychophysiological indices of relaxation in young healthy women.
Howard S, Hughes BM.
National University of Ireland, Galway, Ireland.
OBJECTIVES: In aromatherapy, lavender aroma is reputed to assist with relaxation. However, while there is much anecdotal evidence to that effect, the empirical literature is very inconsistent. Failure to employ adequate placebos, proper blinding, objective measures, or screening of prior beliefs about aromatherapy means that many previous findings could have been influenced by expectancy biases. The present study sought to establish whether lavender aroma and/or expectancies affect post-stress relaxation. DESIGN: A double-blind, 3 (aroma) x 3 (instruction) x 10 (time in minutes) mixed-factorial placebo-controlled trial. METHOD: In a laboratory, **96 healthy undergraduate women** were exposed to lavender, placebo, or no aroma during physiologically assessed relaxation after an arousing cognitive task. **Where an aroma was presented, an instructional priming procedure was used to manipulate participants' expectancies about the aroma's likely impact on their ability to relax**. RESULTS: Results showed no effect of aroma on galvanic skin response during relaxation. However, the nature of instructional prime was associated with relaxation patterns: **when expecting the aroma to inhibit them, participants relaxed more;** when expecting facilitation, participants relaxed less. The effect was not seen with regard to self-reported relaxation (as represented by changes in state anxiety) and was independent of ratings of attitudes towards aromatherapy. CONCLUSIONS: **The findings imply that the previous associations of lavender aroma with assisted relaxation may have been influenced by expectancy biases, and that the relevant expectancies are easily manipulable.**
Discussion: while the basic premise is correct, the hypothesis does not stand up, because of the previous anxiolytic effects produced on mice, rats, and gerbils, who have no expectations about the fragrance of lavender.

In some studies we can learn of a new development that could be integrated into a traditional treatment. We also learn interesting new acronyms.

J Altern Complement Med. 2008 Oct;14(8):947-56.
Pharmaco-physio-psychologic effect of Ayurvedic oil-dripping treatment using an essential oil from Lavendula angustifolia.
Xu F, Uebaba K, Ogawa H, Tatsuse T, Wang BH, Hisajima T, Venkatraman S.
University of Toyama, Presymptomatic Health Promotion, Institute of Natural Medicine, University of Toyama, Toyama City, Japan. xufh@inm.u-toyama.ac.j.p
Ayurvedic oil-dripping treatment, Shirodhara, involves the use of medicated herbal sesame oils. In our previous reports, we found that Shirodhara with plain sesame oil induced anxiolysis and an **altered state of consciousness (ASC)** in healthy subjects. **We studied the pharmaco-physio-psychologic effect of Shirodhara with medicated sesame oil including an essential oil from Lavendula angustifolia (lavender) in the present study.** Sixteen (16) healthy females (38 +/- 8 years old) were assigned at random to three treatments applied by a robotic oil-dripping system: plain sesame oil (plain Shirodhara), medicated sesame oil with a 0.3 volume % of lavender essential oil (lavender Shirodhara), or the control supine position. Psychophysiologic parameters including the heart rate, skin temperature of the dorsum of hands and feet, as well as anxiety and ASC were monitored, and the rates of change of these items were calculated to assess the psychophysiologic changes brought about by Shirodhara. **Lavender Shirodhara showed potent anxiolytic and ASC-inducing or promoting effects**, and induced the largest increase in foot skin temperature. The correlation between anxiolysis and ASC, as well as the correlation between these psychologic effects and the elevated foot skin temperature were larger in the lavender Shirodhara than in the other two conditions. **It was speculated that the psycho-physiologic effects of lavender Shirodhara would be brought about by three mechanisms: (1) the well-known relaxing action of essential oils from L. angustifolia mediated by olfactory nerves, (2) the pharmacologic action of substances absorbed through the skin or mucosa in the sesame oil or lavender essential oil, and (3) the physiologic effect of sesame oil dripped on the forehead induced by the somato-autonomic reflex through thermosensors or pressure sensors in the skin or hair follicles via the trigeminal cranial nerve**. The complicated pharmaco-physio-psychologic action of Ayurvedic oil treatment may provide a useful model for future pharmaco-physio-psychotherapy.

Sometimes we find amusing studies. This one is for people who are afraid of watching scary movies. We also learn here that lavender can be administered in capsules orally, in case you are afraid of attracting attention to yourself in the theater.

Hum Psychopharmacol. 2009 Jun;24(4):319-30.

Effects of orally administered lavender essential oil on responses to anxiety-provoking film clips.
Bradley BF, Brown SL, Chu S, Lea RW.
School of Psychology, University of Central Lancashire, Lancashire, UK.
bfhornby@uclan.ac.uk
BACKGROUND: Lavender odour is commonly used to alleviate mild anxiety. Double blind studies are difficult to conduct with odours, and there are few reliable investigations of lavender's efficacy. METHOD: **Orally administered lavender capsules** (placebo, 100, 200 microl) were tested in a randomised between-subjects (n = 97) double-blind study. **Film clips were used to elicit anxiety**. Measures included anxiety, State Trait Anxiety Inventory (STAI), mood, positive and negative affect scale (PANAS), heart rate (HR), galvanic skin response (GSR), and heart rate variation (HRV). Following baseline measurements capsules were administered. **Participants viewed a neutral film clip, then an anxiety-provoking and light-hearted recovery film clip.** RESULTS: For the 200 microl lavender dose during the neutral film clip there was a trend towards reduced state anxiety, GSR and HR and increased HRV. In the anxiety-eliciting film, lavender was mildly beneficial in females but only on HRV measures. In males sympathetic arousal increased during the anxiety film (GSR). HRV significantly increased at 200 microl during all three film clips in females, suggesting decreased anxiety. CONCLUSION: **These findings suggest that lavender has anxiolytic effects in humans under conditions of low anxiety, but these effects may not extend to conditions of high anxiety.**

Sometimes we find a study that has profound implications for people who want or need to get off of habituating and toxic prescriptions. We find again the use of lavender in capsule form.

Phytomedicine. 2009 Dec 2. [Epub ahead of print]
A multi-center, double-blind, randomised study of the Lavender oil preparation Silexan in comparison to Lorazepam for generalized anxiety disorder.
Woelk H, Schläfke S.
Surgery for psychiatry and psychotherapy, Buseck-Beuern, Germany.
Generalized and persistent anxiety, accompanied by nervousness and other symptoms (Generalised Anxiety Disorder, GAD) is frequent in the general population and leads to **benzodiazepine** usage. Unfortunately, these substances induce sedation and have a high potential for drug abuse, and there is thus a need for alternatives. As the anxiolytic properties of lavender have already been demonstrated in pharmacological studies and small-scale clinical trials, it was postulated that lavender has a positive effect in GAD. A controlled clinical study was then performed to evaluate the efficacy of **silexan, a new oral lavender oil capsule preparation**, versus a benzodiazepine. In this study, the efficacy of a

6-week-intake of silexan compared to lorazepam was investigated in adults with GAD. The primary target variable was the change in the Hamilton Anxiety Rating Scale (HAM-A-total score) as an objective measurement of the severity of anxiety between baseline and week 6. The results suggest that silexan effectively ameliorates generalized anxiety comparable to a common benzodiazepine (lorazepam). The mean of the HAM-A-total score decreased clearly and to a similar extent in both groups (by 11.3+/-6.7 points (45%) in the silexan group and by 11.6+/-6.6 points (46%) in the lorazepam group, from 25+/-4 points at baseline in both groups). During the active treatment period, the two HAM-A subscores "somatic anxiety" (HAM-A subscore I) and "psychic anxiety" (HAM-A subscore II) also decreased clearly and to a similar extent in both groups. The changes in other subscores measured during the study, such as the SAS (Self-rating Anxiety Scale), PSWQ-PW (Penn State Worry Questionnaire), SF 36 Health survey Questionnaire and Clinical Global Impressions of severity of disorder (CGI item 1, CGI item 2, CGI item 3), and the results of the sleep diary demonstrated comparable positive effects of the two compounds. **In conclusion, our results demonstrate that silexan is as effective as lorazepam in adults with GAD. The safety of silexan was also demonstrated. Since lavender oil showed no sedative effects in our study and has no potential for drug abuse, silexan appears to be an effective and well tolerated alternative to benzodiazepines for amelioration of generalised anxiety.**

Lett Appl Microbiol. 2008 Sep;47(3):167-73.
Comparison of bacteriostatic and bactericidal activity of 13 essential oils against strains with varying sensitivity to antibiotics
Mayaud L, Carricajo A, Zhiri A, Aubert G.
Antibiology Laboratory, CHU Hospital Nord, Saint-Etienne, France.
AIMS: To compare the bacteriostatic and bactericidal activity of 13 chemotyped essential oils (EO) on 65 bacteria with varying sensitivity to antibiotics. METHODS AND RESULTS: Fifty-five bacterial strains were tested with two methods used for evaluation of antimicrobial activity (CLSI recommendations): the agar dilution method and the time-killing curve method. EO containing aldehydes (Cinnamomum verum bark and Cymbopogon citratus), phenols (Origanum compactum, Trachyspermum ammi, Thymus satureioides, Eugenia caryophyllus and Cinnamomum verum leaf) showed the highest antimicrobial activity with minimum inhibitory concentration (MIC) <2% (v/v) against all strains except Pseudomonas aeruginosa. Alcohol-based EO (Melaleuca alternifolia,

Cymbopogon martinii and Lavandula angustifolia) exhibited varying degrees of activity depending on Gram status. EO containing 1.8-cineole and hydrocarbons (Eucalyptus globulus, Melaleuca cajeputii and Citrus sinensis) had MIC(90%) > or = 10% (v/v). Against P. aeruginosa, only C. verum bark and O. compactum presented MIC < or =2% (v/v). Cinnamomum verum bark, O. compactum, T. satureioides, C. verum leaf and M. alternifolia were bactericidal against Staphylococcus aureus and Escherichia coli at concentrations ranging from to 0.31% to 10% (v/v) after 1 h of contact. Cinnamomum verum bark and O. compactum were bactericidal against P. aeruginosa within 5 min at concentrations <2% (v/v). CONCLUSIONS: Cinnamomum verum bark had the highest antimicrobial activity, particularly against resistant strains. Significance AND IMPACT OF THE STUDY: Bacteriostatic and bactericidal activity of EO on nosocomial antibiotic-resistant strains.