



Common Pregnancy Problems: An Integrative Approach

Aviva Romm MD and midwife

Goals

- Mitigate the need for unnecessary medical intervention for some common pregnancy situations safely, naturally, and gently with evidence based botanical and supplement approaches
- Know when medical intervention is necessary

Case 1: Constipation and Herbs



Case 2: Threatened Induction



Prevalence of Botanical Medicine Use by Pregnant Women

- Epidemiologic studies and surveys from the US, UK, and Australia estimate that 7% to 45% of women use herbs during pregnancy.
- Glover et al. found that 45.2% of 587 pregnant women in a rural obstetric population had used herbal medications (95.8% had used prescription and 92.6% had self-prescribed OTCs).
- In another study, a one-page questionnaire examining the use of all prescription and nonprescription medications, including herbal remedies, was sent to parturients expected to deliver within 20 weeks. 61% responded to the survey, with 7.1% reporting the use of herbal remedies. Only 14.6% of users considered herbs to be medications.
- In another study, approximately one-third of 463 postpartum women surveyed in the US reported having used CAM therapies during pregnancy. Of 734 pregnant women that responded to one survey, 46% used herbal remedies at the recommendation of their health care provider; 54% did so at the recommendation of a friend or family member.
- A study of CNMs in North Carolina indicated that 90% of midwives recommend CAM therapies to patients, with 80% of respondents suggesting herbal therapies for labor stimulation.

Most Commonly Treated Conditions

Additional file 4: The ten most common reasons for using herbal medicines and the most frequently used herbs.

Reason for use	Overall			Western Europe			Northern Europe			Eastern Europe		
	N	% ± SE	Top herbs	N	% ± SE	Top herbs	N	% ± SE	Top herbs	N	% ± SE	Top herbs
Cold or flu	620	18.6 ± 0.7	Cranberry, Echinacea, Garlic, Ginger, Raspberry	136	13.9 ± 1.1	Echinacea, Lemon, Eucalyptus, Peppermint, Sambucus	44	12.9 ± 1.8	Echinacea, Ginger, Sambucus, Peppermint, Primula	400	24.5 ± 1.1	Cranberry, Raspberry, Garlic, Rutin, Chamomile
Nausea	548	16.5 ± 0.6	Ginger, Peppermint, Artichoke, Lemon	224	22.9 ± 1.3	Ginger, Peppermint, Fennel, Lemon, Raspberry	112	32.8 ± 2.5	Ginger	120	7.3 ± 0.6	Ginger, Artichoke, Peppermint
Urinary tract infections	476	14.3 ± 0.6	Cranberry, Dog rose, Rosemary, Seaside centaury, Lovage	75	7.7 ± 0.9	Cranberry	63	18.5 ± 2.1	Cranberry	321	19.6 ± 1.0	Cranberry, Dog rose, Rosemary, Seaside centaury, Lovage
Sedative/sleeping problems	447	13.4 ± 0.6	Valerian, Motherwort, Lemon balm, Chamomile, Peppermint	100	10.2 ± 1.0	Valerian, Passiflora, Chamomile, Lemon balm	6	1.8 ± 0.7	**	317	19.4 ± 1.0	Valerian, Motherwort, Lemon balm, Peppermint, Chamomile
Constipation	304	9.1 ± 0.5	Psyllium, Fiber crops, Senna, Prunes, Flax	136	13.9 ± 1.1	Psyllium, Fiber crops, Senna, Prunes, Aloe vera	26	7.6 ± 1.4	Prunes, Psyllium, Fiber crops, Flax	54	3.3 ± 0.4	Psyllium, Prunes, Senna, Fiber crops, Fennel
Preparation for labour	206	6.2 ± 0.4	Raspberry, Evening primrose, Sage, Nettle, Fennel	119	12.2 ± 1.0	Raspberry, Evening primrose, Sage	34	10.0 ± 1.6	Raspberry, Evening primrose	16	1.0 ± 0.2	Raspberry
Health promotion	117	3.5 ± 0.3	Cranberry, Ginger, Echinacea, Raspberry, Chamomile	31	3.2 ± 0.6	Echinacea, Cranberry, Ginger, Nettle, Lady's Mantle	12	3.5 ± 1.0	Cranberry, Aloe vera	63	3.9 ± 0.5	Cranberry, Ginger, Dog rose, Lemon, Chamomile
Water retention	94	2.8 ± 0.3	Cowberry, Cranberry, Dog rose, St. John's wort, Bidens	3	*	Nettle	1	*	**	87	5.3 ± 0.6	Cowberry, Cranberry, Dog rose, St. John's wort, Bidens
Gastrointestinal disorders, flatulence	89	2.7 ± 0.3	Ginger, Peppermint, Chamomile, Fennel, Cranberry	40	4.1 ± 0.6	Ginger, Peppermint, Fennel, Chamomile	3	0.9 ± 0.5	**	27	1.7 ± 0.3	Ginger, Peppermint, Cranberry
Pain conditions	65	*	Peppermint, Lemon balm, Lemon, Cinnamon, Cloves	14	1.4 ± 0.4	**	8	2.3 ± 0.8	Ginger	34	2.1 ± 0.4	Peppermint, Lemon balm, Lemon, Cinnamon, Cloves

SE: Standard error. Standard errors were calculated for all percentages; however, where the SE > 50% the point estimate is not reported and an "*" is used.

Note: The top 5 herbs are presented where more than 2 women used an herbal medicine. ** no one herb was used by more than 2 women

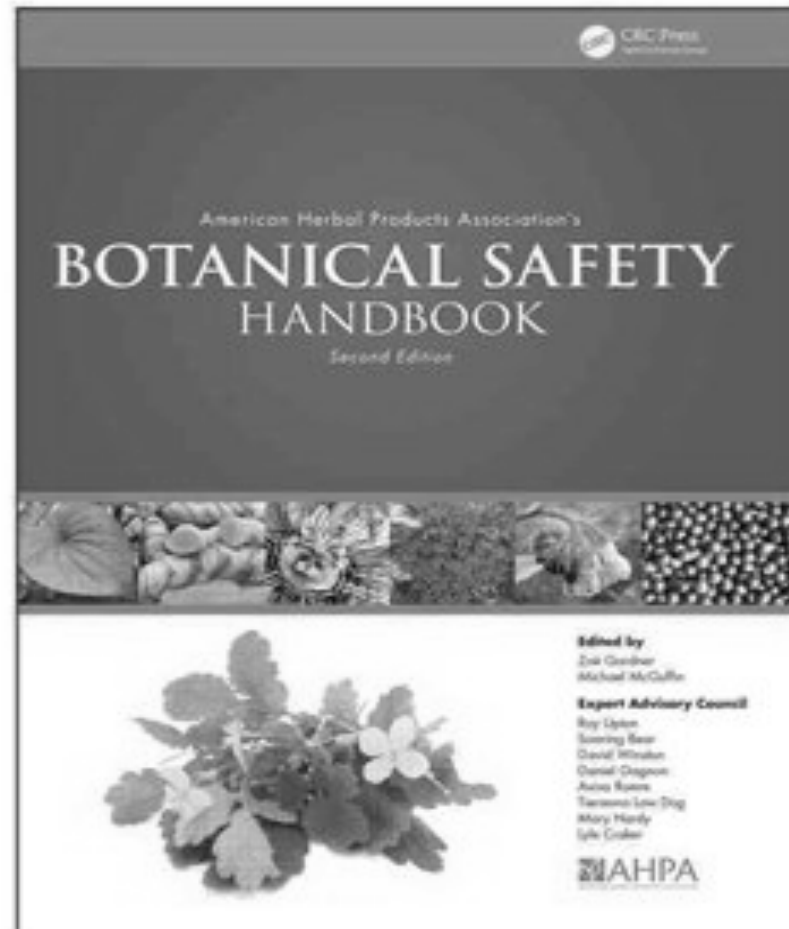
Most Commonly Used Botanicals

Table 1 The 20 most frequently used herbal medicines in pregnancy, overall and according to region

Top 20 herbal medicines	Overall use		REGION						Total number of women n = 2,735 % ± SE
	Total number of herb used (n)	% ± SE	Western Europe n = 888 % ± SE	Northern Europe n = 335 % ± SE	Eastern Europe n = 1,213 % ± SE	North America n = 142 % ± SE	South America n = 62 % ± SE	Australia n = 95 % ± SE	
Ginger	643	12.8 ± 0.5	28.5 ± 1.5	39.1 ± 2.7	12.2 ± 0.9	40.8 ± 4.1	4.8 ± 2.7	52.6 ± 5.1	23.5 ± 0.8
Cranberry	622	12.4 ± 0.5	10.6 ± 1.0	22.4 ± 2.3	35.7 ± 1.4	6.3 ± 2.0	*	10.5 ± 3.1	22.7 ± 0.8
Valerian	391	7.8 ± 0.5	6.9 ± 0.9	*	26.4 ± 1.3	2.8 ± 1.4	*	-	14.3 ± 0.7
Raspberry	301	6.0 ± 0.4	14.8 ± 1.2	11.0 ± 1.7	7.4 ± 0.8	17.6 ± 3.2	-	18.9 ± 4.0	11.0 ± 0.6
Chamomile	194	3.9 ± 0.3	4.2 ± 0.7	1.2 ± 0.6	10.5 ± 0.9	5.6 ± 1.9	27.4 ± 5.7	*	7.1 ± 0.5
Peppermint	188	3.7 ± 0.3	6.5 ± 0.8	2.1 ± 0.8	8.1 ± 0.9	8.5 ± 2.3	12.9 ± 4.3	5.3 ± 2.3	6.9 ± 0.5
Dog rose	149	3.0 ± 0.2	*	*	11.8 ± 0.9	*	*	-	5.4 ± 0.4
Cowberry	142	2.8 ± 0.2	*	*	11.5 ± 0.9	-	-	-	5.2 ± 0.4
Psyllium	132	2.6 ± 0.2	6.1 ± 0.8	1.8 ± 0.7	1.4 ± 0.3	19.7 ± 3.3	12.9 ± 4.3	20.0 ± 4.1	4.8 ± 0.4
Rosemary	98	2.0 ± 0.2	*	-	7.7 ± 0.8	-	-	*	3.6 ± 0.4
Centaury	94	1.9 ± 0.2	-	-	7.7 ± 0.8	-	-	-	3.4 ± 0.3
Lovage	94	1.9 ± 0.2	-	-	7.7 ± 0.8	-	-	-	3.4 ± 0.3
Lemon	93	1.9 ± 0.2	3.8 ± 0.6	*	4.0 ± 0.6	*	6.5 ± 3.1	3.2 ± 1.8	3.4 ± 0.3
Echinacea	92	1.8 ± 0.2	5.0 ± 0.7	4.8 ± 1.2	1.5 ± 0.3	6.3 ± 2.0	*	3.2 ± 1.8	3.4 ± 0.3
Lemon Balm	84	1.7 ± 0.2	2.4 ± 0.5	*	4.9 ± 0.6	*	*	-	3.1 ± 0.3
Motherwort	79	1.6 ± 0.2	-	-	6.5 ± 0.7	-	-	-	2.9 ± 0.3
Garlic	78	1.6 ± 0.2	*	*	5.6 ± 0.7	2.8 ± 1.4	-	*	2.9 ± 0.3
Fiber crops	66	1.3 ± 0.2	3.6 ± 0.6	*	0.5 ± 0.2	9.9 ± 2.5	*	8.4 ± 2.8	2.4 ± 0.3
Uva ursi	65	1.3 ± 0.2	0.1 ± 0.1	-	5.3 ± 0.6	-	-	-	2.4 ± 0.3
Total	3.605	72.0 ± 0.6							

Herb Safety in Pregnancy

- Limited human pregnancy safety studies
- Generally medical community considers “unsafe”
- Historical/traditional use often relied upon
- Most current/useful resource:
Botanical Safety Handbook
- An “integrative botanical approach” is needed.



Representative Contraindicated Herbs

Abortifacients/ Emmenagogues

Blue cohosh, Cottonroot bark, Motherwort, Tansy, Thuja, Safflower, Scotch broom, Rue, Angelica, Mugwort, Wormwood, Yarrow, Pennyroyal essential oil

Essential oils/ Volatile oils

Thuja, Tansy, Oregano, Thyme, Sage
Peppermint, Pennyroyal, Yarrow

Teratogens

Lupinus spp., Veratrum spp., Conium spp., Solanum spp., Nicotiana spp., Ferula spp., Trachymene spp., Datura, Prunus spp., Sorghum, Senecio spp.

Other: Licorice

Alkaloids

Comfrey, Coltsfoot, Borage, Goldenseal, Barberry, Oregon grape

Stimulating laxatives

Cascara sagrada, Castor oil, Buckthorn, Aloes, Rhubarb

Phytoestrogens

Hops, Sage

Nervous system stimulants/depressants:

Ephedra, Guarana, Coffee, Kava

Botanicals Containing Pyrrolizidine

Alkaloids (PAs): Borage, Butterbur (Petasites), Coltsfoot, Comfrey, Eyebright, Life Root (Borage oil does not contain PAs.)

- Romm, A. (2010). *Botanical Medicine for Women's Health*. St. Louis: Churchill Livingstone/Elsevier.
- Gardner, Z. ed. (2013). *American Herbal Products Association's Botanical Safety Handbook* (2nd ed.). Hoboken: CRC Press.

TABLE 1:

HERBS CONSIDERED SAFE IN PREGNANCY

An overview of herbs that have been demonstrated to be safe to use during pregnancy through clinical trials or scientific evaluation of safety.



common name	botanical name	reason for use	clinical trials in pregnancy	typical daily dose	comments
Red raspberry leaf	<i>Rubus idaeus</i>	Mineral-rich nutritive tonic, uterine tonic to promote an expedient labor with minimal bleeding. Can also be used as an astringent in cases of diarrhea.	Positive ^{1,2}	1.5–5 gm daily in tea or infusion	Highly astringent herbs can theoretically interfere with intestinal absorption of nutrients. [Editor's note: Use lower dose for long-term administration.]
Echinacea	<i>Echinacea spp</i>	Reduce duration or recurrence of colds and upper respiratory infection (URI).	Positive ³	5–20 ml tincture [alcohol extract]	The dose listed here and considered safe by most herbalists is higher than that used in the study referenced.
Ginger	<i>Zingiber officinalis</i>	Prevent and relieve nausea and vomiting of pregnancy.	Positive ^{4,5}	Up to 1 gm dried powder daily	Higher doses of ginger are traditionally considered to promote menstrual discharge (i.e., they are emmenagogic). Untreated excessive vomiting in pregnancy can cause serious adverse outcomes.
Cranberry	<i>Vaccinium macrocarpon</i>	Prevent and relieve urinary tract infection (UTI).	None found	16–32 fl oz of juice daily	Untreated UTI in pregnancy can cause serious adverse outcomes.
Chamomile	<i>Matricaria recutita</i>	Promote general relaxation, treat insomnia, treat flatulence.	None found	1–5 gm daily in tea	No reasonable contraindications. ⁶

Preventative Care

Nutrition the cornerstone of health in pregnancy → Prevention of chronic, lifelong health problems for child

- What to Eat?
- Eating for Two is a Myth
- How Much Weight Gain?
- Supplementation
 - Vitamin D
 - Iron
 - Essential Fatty Acids
- MTHFR



NVP & *Hyperemesis gravidarum*

- Documented lifesaving use in tx of hyperemesis on papyrus dating as far back as 2000 BCE. The earliest reference is in Soranus' *Gynecology* from the 2nd century CE.
- Some degree of nausea, with or without vomiting, occurs in 50% to 90% of all pregnancies.
- Generally begins at about 5-6 weeks of gestation and usually abates by 16 -18 weeks gestation.
- 15% to 20% of pregnant women will continue to experience some degree of NVP into the third trimester, and approximately 5% will continue to experience it until birth.
- Possible protective function.



NVP & *Hyperemesis gravidarum*

- Studies have demonstrated that women who experience some degree of NVP are less likely to miscarry or experience stillbirth.
- Symptoms of hyperemesis gravidarum include persistent vomiting (and often dry heaving as well) accompanied by weight loss exceeding 5% of pre-pregnancy body weight and ketonuria unrelated to other causes.
- It is generally incapacitating. It is estimated that hyperemesis occurs in 0.3% to 2% of pregnancies.
- Hyperemesis typically persists into the second trimester, and may continue until the time of birth. Hospitalization for hyperemesis is common, peaking at approximately 9 weeks gestation and leveling off at around 20 weeks. The pathogenesis of hyperemesis is unknown.

NVP & *Hyperemesis gravidarum*

Supportive therapy; IVF if unremitting vomiting or severe anorexia

Vitamin B6 (Pyridoxine)

- ACOG considers pyridoxine a first-line treatment. Some clinical research shows that taking 25 mg every 8 hours for 72-96 hours significantly reduces pregnancy-related nausea and vomiting compared to placebo. Lower doses also help for nausea, but might not work as well for preventing vomiting.

Ginger

- The best studied herb for NVP is *Zingiber officinalis*.
- A systematic literature search by Borrelli et al. identified six double-blind RCTs with a total of 675 participants and a prospective observational cohort study, which met the inclusion criteria for the review. The methodological quality of 4 of 5 of the RCTs was high according to the Jadad scale.
- Four of the six RCTs ($n = 246$) showed superiority of ginger over placebo; the other two RCTs ($n = 429$) indicated that ginger was as effective as the reference drug (vitamin B₆) in relieving the severity of nausea and vomiting episodes, including one study by Fischer-Rasmussen et al. that demonstrated efficacy and was superior to placebo for the treatment of hyperemesis gravidarum.

- The observational study and RCTs showed the absence of significant side effects or adverse effects on pregnancy outcomes. No case reports of adverse events during ginger treatment in pregnancy.
- The evidence, both scientific and traditional, is that ginger is safe and effective for some women with mild or moderate nausea and vomiting of pregnancy.
- Generally recommended dose = up to 1 g daily



NVP & *Hyperemesis gravidarum*

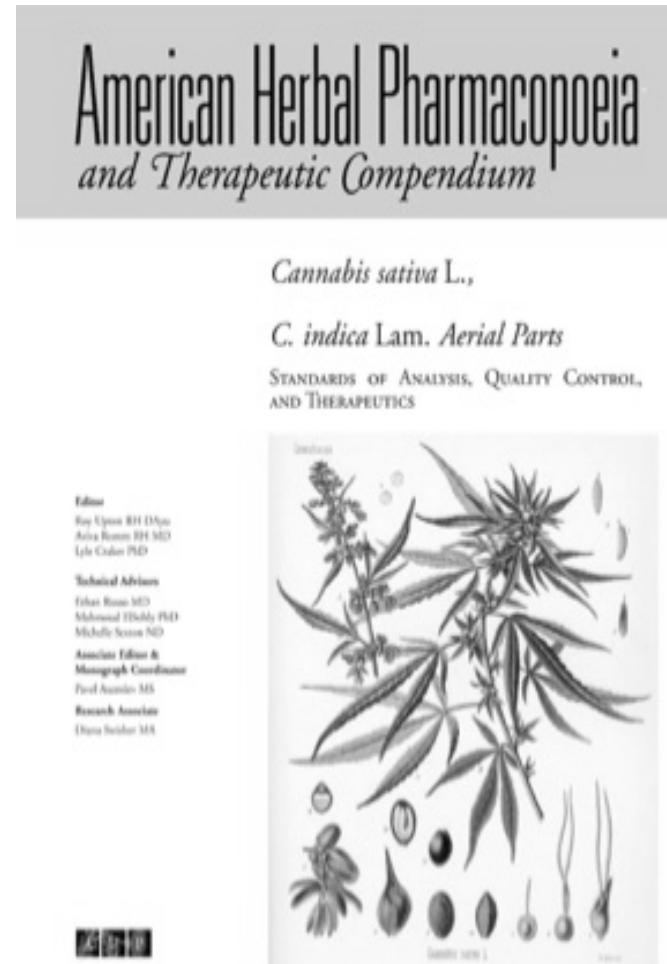
Peppermint

- Long history of use as a digestive aid
- The role of peppermint in the treatment of NVP has not been investigated; however, some benefit has been shown for the treatment of postoperative nausea, and also for the treatment of esophageal dysmotility, a physiologic finding that is also postulated as part of the etiology of NVP.
- Neither the *Botanical Safety Handbook*, nor the German Commission E contradict the use of peppermint during pregnancy.



Cannabis

- First described in Western medical literature by a physician in Ohio who used an extract of *Cannabis indica* to successfully remedy a near fatal case of *Hyperemesis gravidarum*.
- Substantial data on the efficacy of the 5-HT₃-receptor antagonists, including cannabinoids, offer enhanced control of nausea, emesis, and anorexia while causing few side effects.
- Clinical trials that have looked at the efficacy of cannabis as an antiemetic have found it better than conventional antiemetics. Commonly self-rx'd for NVP
- Tremendous controversy over safety in pregnancy though most data suggests overwhelmingly safe for short term use; confounding socioeconomic variables in pregnancy safety reviews.



Constipation

- Prevalence 11% to 38% of pregnant women.
- Women habitually constipated may become more so during pregnancy.
- Due to decreased gastric motility in pregnancy as a result of increased circulating progesterone levels.
- Elevated estrogen concentrations are involved in delayed motility through an enhancement of nitric oxide release.
- Slow transit time of food through the intestinal tract leads to increased water absorption and thereby to constipation.
- Dietary factors, particularly inadequate fiber intake and lack of exercise, contribute to constipation, as does increased pressure of the growing uterus on the rectum as pregnancy becomes advanced.
- Ignoring the urge to have a bowel movement can also contribute to the problem.
- Iron-deficiency anemia can contribute to constipation, as can elemental iron supplements

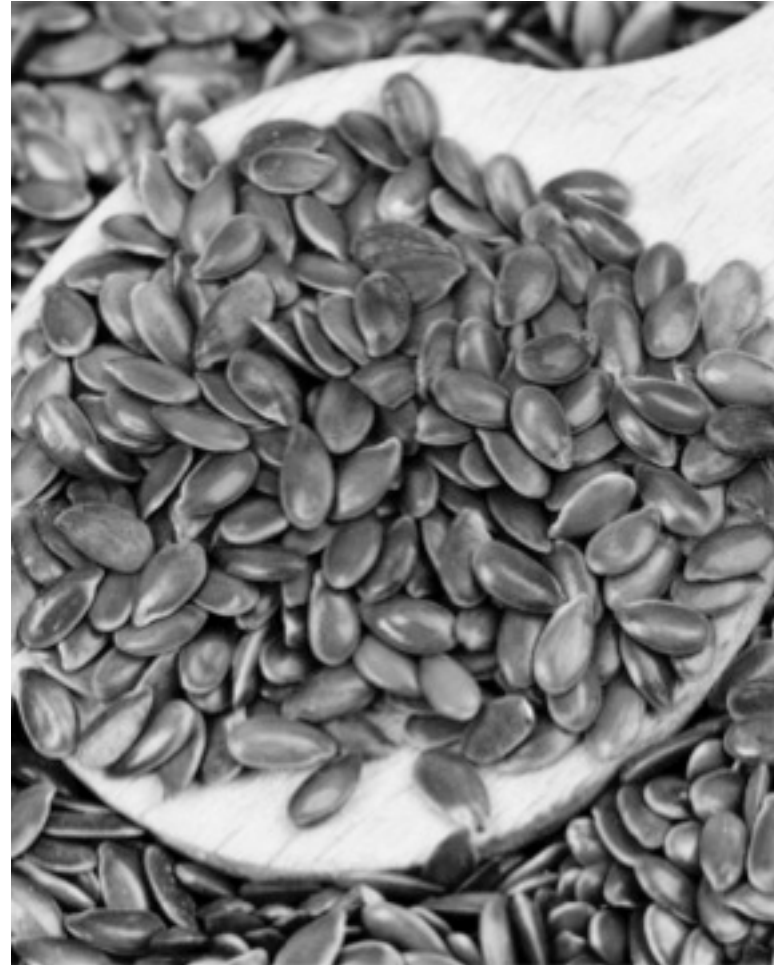
Supportive Treatment

- Magnesium citrate (osmotic laxative)
- Dietary fiber
- Exercise
- Good stooling habits
- Probiotics
- Bulk laxatives



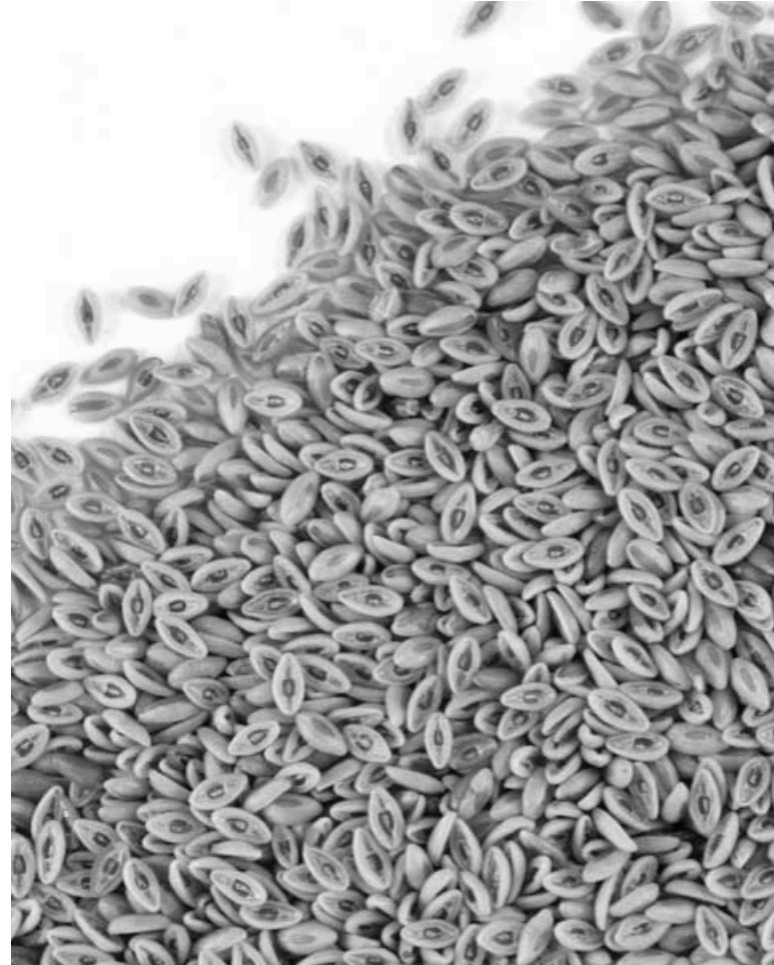
Flax Seed

- A source of dietary fiber with a bulk forming laxative effect.
- In a clinical trial of healthy young adults, flaxseed muffins containing 25 g of flaxseed twice daily for 4 weeks increased weekly bowel movements by 30% compared to a control group.
- In another clinical trial, flaxseed-containing yogurt increased stool frequency compared to a control yogurt in elderly patients with mild constipation.



Psyllium Seed and Husk

- Bulk laxative agents.
- Shorten bowel transit time by increasing intestinal contents and stimulating stretch receptors and thereby peristalsis.
- The whole seeds or husks are soaked in water or apple juice for several hours and then they are taken with a large amount of liquid.
- Bowel movements are usually achieved within 6 to 12 hours. Rarely, allergic reactions have occurred.
- Preparation should not be taken by patients with swallowing difficulties because choking can occur.



Senna Leaf and Pod

- Quick-acting, reliable stimulating laxative generally, is taken as a tea. Mechanism of action is primarily via anthracoids (sennoside A and B), or anthraquinone glycosides.
- Considered appropriate for use in acute cases and considered safe in pregnancy Use with carminatives to prevent griping.
- According to the European Scientific Cooperative on Phytotherapy (ESCOP) there are no reports of undesirable or damaging effects during pregnancy or on the fetus when senna is used in accordance with the recommended dosing and use schedule. A review article reported that senna appears to be the most appropriate stimulant laxative to use during pregnancy.
- The dose recommended by ESCOP is individualized to the smallest possible dose that produces a comfortable, soft, formed stool. Weiss states that small doses of 1 to 2 g soften the stools within 5 to 7 hours.

Yellow Dock Root

- Yellow dock is sometimes contraindicated during pregnancy because of its anthraquinone glycoside contents.
- Clinically, it is widely used by midwives as a gentle stimulating laxative because it is effective yet much milder than senna, which is generally avoided when possible.
- According to the *Botanical Safety Handbook*, this herb contains only a small amount of anthraquinone glycosides and has a mild laxative effect.
- Limited maternal use has not been observed to cause any increase in fetal malformation or other harmful effects to the fetus.

Vulvovaginal Candidiasis

	Bacterial Vaginosis	Vulvovaginal Candidiasis	Trichomoniasis
Discharge color	• Thin, off-white discharge	• Curdy whitish to yellowish-white discharge	• Yellow green or colorless copious discharge
Discharge odor	• Malodorous discharge with a characteristic fishy odor that may be increased after sexual intercourse	• May have no odor, or odor may be reminiscent of yeasted bread	• Malodorous
Physical findings	• Discharge and odor may be apparent; discharge may be adherent to vaginal walls; tissue typically appears normal	• Vulvovaginal redness, swelling, and fissures; discharge appears thick, whitish, and adherent to vaginal walls	• Vulvovaginal redness, swelling, "strawberry" cervix. Frothy and purulent discharge is visible
Vaginal pH (normal <4.5)	• High (>4.5)	• Normal	• High (>4.5)

- GDM? Borderline blood sugar?
- Parallel 4R program for gut AND vagina
- Vaginal and oral probiotic with *L. reuteri* and *L. rhamnosus*
- Topical application of live active culture yogurt
- Good data on tea tree oil for candida spp.
- Also consider garlic applied topically as a suppository, oregano, thyme and lavender EO's

Garlic

- A single clove is carefully peeled and inserted whole at each application, usually at night in left in during sleep. It is sometimes dipped in a small amount of vegetable oil to ease insertion.
- It can be removed manually.
- In vitro, garlic has demonstrated antimicrobial effects against a wide range of bacteria and fungi including *E. coli*, *Proteus*, *Mycobacterium*, and *Candida* species.
- In a study by Sandhu et. al, 61 yeast strains, including 26 strains of *C. albicans* were isolated from the vaginal, cervix, and oral cavity of patients with vaginitis and were tested against aqueous garlic extracts. Garlic was fungistatic or fungicidal against all but two strains of *C. albicans*.
- In another in vitro study an aqueous garlic extract effective against 22 strains of *C. albicans* isolated from women with active vaginitis.
- At body temperature, garlic had mostly fungicidal activity; below body temperature the action was mostly fungistatic.
- Cases of irritation and even chemical burn have been reported after prolonged application of garlic to the skin or mucosa.



Tea Tree Oil

- Medical use of the oil as an antiseptic was first documented in the 1920's, and led to its commercial production, which remained high throughout World War II.
- At concentrations lower than 1% TTO may be bacteriostatic rather than antibacterial.
- Several studies have demonstrated efficacy against *C. albicans*, however, to date no clinical trials have been done.
- Animal model of vaginal candidiasis supports the use of TTO for VVC.



Additional Botanicals

- Uva ursi is used by midwives as a topical antiseptic and astringent to relieve vulvar and urethral irritation associated with vulvovaginitis. Leaf preparations have shown antimicrobial activity against *C. albicans*, *S. aureus*, *E. coli*, and other pathogens.
- *Thyme essential oil has also found to be specifically effective against Candida species.*
- In vitro studies demonstrate a rational use of goldenseal and berberine containing herbs for their antibacterial properties. Berberine has demonstrated specific activity against *C. albicans* and *C. tropicalis* as well as to a species of trichomonas, *T. mentagrophytes*, amongst other pathogens.

Varicosities

- Varicosities are exceedingly common during pregnancy, when they often appear for the first time.
- 40% of all pregnant women affected.
- They most commonly appear on the lower legs and rectum (hemorrhoids), although vulvar varicosities may also occur.
- The physiologic changes of pregnancy are responsible for the development of varicosities.
 - Hormonal changes that cause increased fragility of the blood vessel walls.
 - Increased iliac venous pressure owing to the enlarging uterus, leading to reflux of blood in the vessels and subsequent, rupture of valves, and the appearance of varicosities.
 - Saphenous veins contain estrogen and progesterone receptors may play a role in pregnancy-mediated varicose vein development, although the role of these receptors is not entirely known.

Horse chestnut seed extract

- Taken orally can reduce some symptoms of chronic venous insufficiency, such as varicose veins, pain, tiredness, tension, swelling in the legs, itching, and edema.
- Clinical studies have used extracts standardized to 16-20% aescin.
- Horse chestnut seed extract 300 mg containing 50 mg aescin has been used twice daily, for 2-12 weeks.
- A review of the scientific literature yields 7 well-designed studies that support the superiority of HCSE over placebo and suggest that the herbal product may be equal to compression stockings in efficacy.



HCSE

- Although the herb is generally not recommended for use in pregnancy, this is owing to lack of data rather than contraindication based on known adverse effects.
- No teratogenic effects have been observed in animals given very high doses of extract by oral route, although fetal body weights were reduced compared with controls.
- Steiner et al. conducted a double-blind, placebo-controlled study of HSCE use during pregnancy. Fifty-two women with leg edema owing to pregnancy-induced venous insufficiency received 300 mg of Venostasin (240 to 290 mg of HSCE standardized to 50 mg aescin) twice daily for 2 weeks. No adverse effects were observed.

Bilberry

- Preliminary clinical research suggests that bilberry extract containing anthocyanins 173 mg daily for 30 days reduces symptoms of CVI vs. placebo.
- Other clinical evidence suggests that bilberry anthocyanins 100-480 mg daily for up to 6 months improves edema, pain, bruising, and burning associated with CVI.
- Has been reported to be safe for internal use during pregnancy, and efficacious in the treatment of gestational hemorrhoids and venous insufficiency of pregnancy.
- It is taken in two and three divided doses of 160 to 340 mg per day, depending upon the severity of the condition.
- It may also be taken in liquid extract form.
- Bilberry can be taken prophylactically in women with a predisposition to varicosities or a family history of gestational varicosities.



Varicosities

Pycnogenol

- Taken orally seems to significantly reduce symptoms of leg pain and heaviness, and edema in people with chronic venous insufficiency (CVI) when used for 3-12 weeks.
- The dose of pycnogenol used most often is 100-120 mg three times, but lower doses of 50 mg three times daily or 45 mg to 90 mg once daily also seem to be effective..
- Pycnogenol appears to be more effective than HCSE
- In preliminary clinical research, pycnogenol has been used during the third trimester of pregnancy with apparent safety.

Nettle Leaf

- Nettle leaf is highly valued by herbalists for its purported venotonic actions.
- Used by herbalists and midwives for the treatment of varicosities.
- It is taken internally as a strong daily nutritive infusion. Its use is empirically based.
- No herbal or scientific studies were identified on the use of nettle leaf for the treatment of varicosities.
- Animal studies are lacking on the use of this herb in pregnancy.

Also: Topical use of Witch Hazel, Black Tea, White Oak, Yarrow

Heartburn

- Up to 2/3 of women experience reflux during pregnancy.
- Only rarely it is an exacerbation of pre-existing disease.
- Symptoms may begin as early as the first trimester and cease soon after birth.
- Most women first experience reflux symptoms after 5 months of gestation; however, many women report the onset of symptoms only when they become very bothersome, long after the symptoms actually began.
- The prevalence and severity of heartburn progressively increases during pregnancy.
- Exact causes(s) of reflux during pregnancy include relaxed lower esophageal tone, secondary to hormonal changes during pregnancy, particularly the influence of progesterone, and mechanical pressure of the uterus on the stomach which contributes to reflux of gastric acids into the esophagus, however, this is contested by some.

Supportive measures

- Eliminate common food triggers
- Avoid large meals
- Avoid eating within 3 hours of going to sleep

Botanicals

- DGL: while licorice not considered appropriate for use during pregnancy, the DGL form appears to be safe
- Use demulcent herbs including slippery elm lozenges and marshmallow root tea

Colds and Flu

- Elevation while sleeping
- Saline nasal rinses
- Steams with antimicrobial EOs (thyme, eucalyptus)
- Hydration
- Salt water gargle
- Honey for cough
- Mentholated chest rub for cough, congestion
- Ginger tea for cough, fever, aches, GI symptoms
- Chamomile, lemon balm for aches, fever, sleep
- Elderberry syrup not studied but BSH identified no adverse effects in the literature
- Echinacea considered safe for use in pregnancy



Colds and Flu – Echinacea

- Echinacea the most widely used herb by pregnant women
- No reports of adverse events
- When used orally, short-term, there is preliminary evidence that mothers can safely use echinacea for 5-7 days during the first trimester of pregnancy without adversely affecting the fetus

- **STUDY:** A total of 206 women were enrolled in the study group after using echinacea products during pregnancy; 112 women used the herb in the first trimester. There were a total of 195 live births, including 3 sets of twins, 13 spontaneous abortions, and 1 therapeutic abortion. Six major malformations were reported, including 1 chromosomal abnormality, and 4 of these malformations occurred with echinacea exposure in the first trimester. In the control group, there were 206 women with 198 live births, 7 spontaneous abortions, and 1 therapeutic abortion. Seven major malformations were reported. There were no statistical differences between the study and control groups for any of the end points analyzed.

- **CONCLUSIONS:** This first prospective study suggests that gestational use of echinacea during organogenesis is not associated with an increased risk for major malformations.

Insomnia

- *Pregnancy-associated sleep disorder* is the association of sleep disturbance with pregnancy and the self-limited nature of these problems.
- Disrupted sleep during pregnancy is associated with poorer obstetric outcomes, in particular length of labor and type of delivery.
- In a prospective, longitudinal follow-up of 131 pregnant women, Lee and Gay demonstrated that women who slept less than 6 hours at night had longer labors and were 4.5 times more likely to have cesarean deliveries.
- The exact incidence of sleep disorders in pregnancy is unknown, but it is estimated that as many as 90% of women experience them during the third trimester.



Insomnia

- Sleep hygiene, massage, tx RLS, support pillows, manage nighttime hypoglycemia
- Lack of botanical safety studies of nervines during pregnancy though considered safe in BSH.
- Use aromatic botanicals in the form of aromatherapy.
- Teas are an excellent form for using sleep promoting aromatic herbs such as chamomile, lavender, and lemon balm; unfortunately, drinking tea close to bedtime often causes the pregnant woman to awaken within a couple of hours after falling asleep with the need to urinate. Tinctures are an alternative.
- Stronger nervine herbs may be considered for short term use for severe insomnia in 3rd trimester though safety data is lacking and caution is advised. According to the BSH animal data suggests no adverse effects from valerian at relatively high doses in pregnancy.
- My go-to's are lavender, chamomile, valerian, and passionflower, in that order.



Group B Streptococcus

- Gram positive, beta hemolytic bacteria
- Common colonizer of human gastrointestinal and genitourinary tracts
- Recognized as causing disease in humans in the 1930s
- Causes serious disease in young infants, pregnant women and older adults
- Emerged as most common cause of sepsis and meningitis in infants <3 months in the 1970s

Early Onset GBS Leading infectious cause of neonatal sepsis in U.S.

- Annual incidence in 2008: 0.28 cases / 1,000 live births
- Estimated 1,200 cases in 2008

Clinical presentation

- Typically symptoms appear on day 0 or day 1 of life
- Respiratory distress, apnea, signs of sepsis most common symptoms
- Bacteremia most common form of disease (app. 80% of cases)
- Pneumonia and meningitis less common

Case fatality rate

- 1970s: As high as 50%
- 4-6% in recent years

Group B Streptococcus

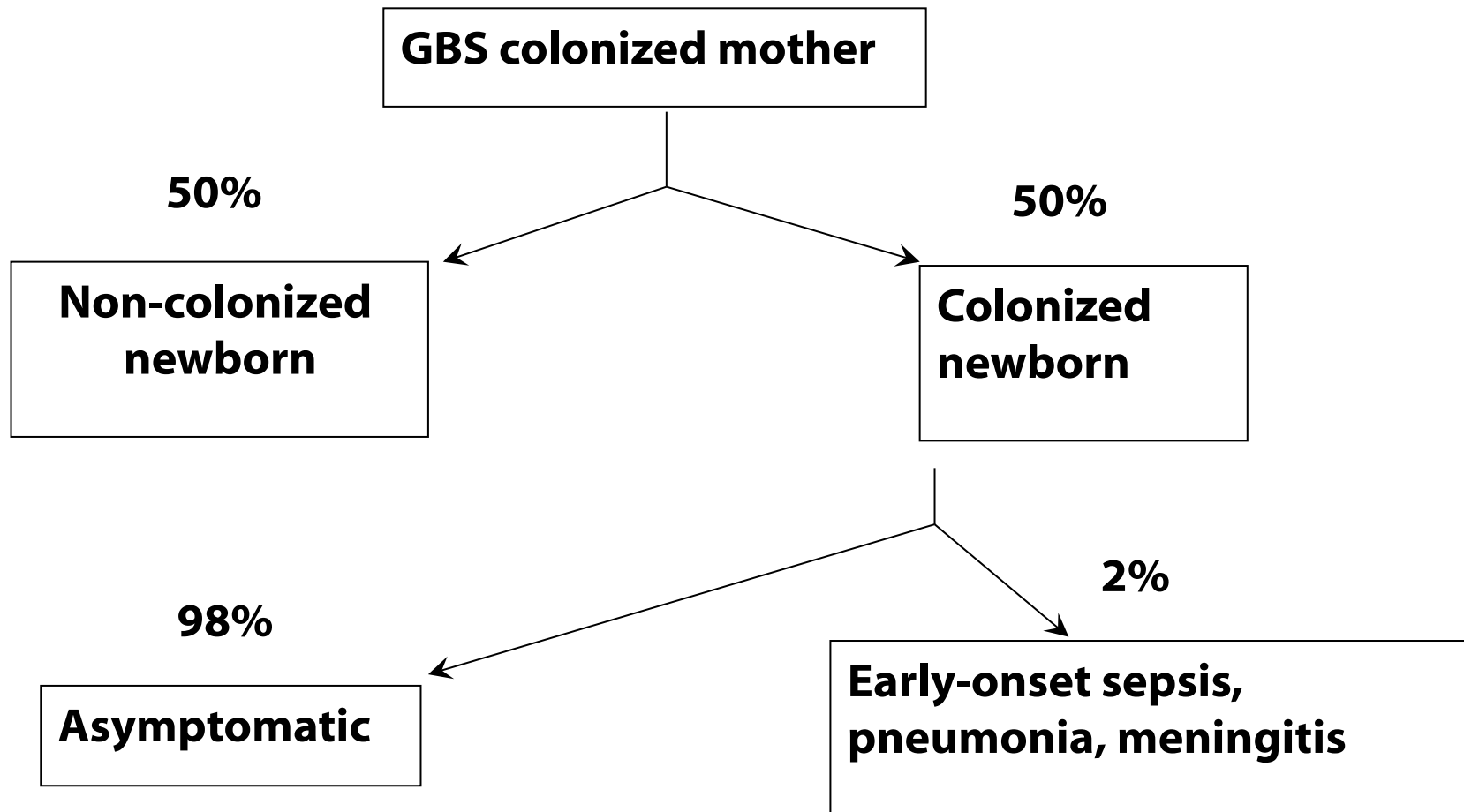
GBS Carriers

- 10% - 30% of women
- Higher proportion in African Americans and nonsmokers
- GBS usually live in gastrointestinal tract but can spread to the genital tract
- No symptoms or signs on examination
- Colonization comes and goes over months
- Not a sexually transmitted infection

Risk factor for early-onset disease: GBS colonization during labor and delivery

- Positive urine culture in early pregnancy
- Prenatal cultures late in pregnancy can predict delivery status

Mother to Infant Transmission of GBS



(39)

Additional Risk Factors for Early-onset GBS Disease

- Obstetric risk factors:
 - Preterm delivery
 - Prolonged rupture of membranes
 - Infection of the placental tissues or amniotic fluid / fever during labor
- GBS in the mother's urine during pregnancy (marker for heavy colonization)
- Previous infant with GBS disease
- Low maternal levels of anti-GBS antibodies
- Demographic risk factors
 - African American
 - Young maternal age

Intrapartum PPX Indicated

- Previous infant with invasive GBS disease
- GBS bacteriuria during current pregnancy
- Positive GBS screening test during current pregnancy
- Unknown GBS status AND any of the following:
 - Delivery at <37 weeks' gestation
 - Amniotic membrane rupture ≥ 18 hours
 - Intrapartum temperature $\geq 100.4^{\circ}\text{F}$ ($\geq 38.0^{\circ}\text{C}$)

Intrapartum PPX NOT Indicated

- Colonization with GBS during a previous pregnancy
 - Unless another indication during the current pregnancy
- GBS bacteriuria during a previous pregnancy
 - Unless another indication during the current pregnancy
- Negative vaginal and rectal GBS screening test during the current pregnancy
- Regardless of intrapartum risk factors
- Cesarean delivery performed before labor onset on a woman with intact amniotic membrane
 - Regardless of maternal GBS test status
 - Regardless of gestational age

Breech: Late Pregnancy

At 32 weeks pregnancy, prevalence of breech presentation is 16%; by term 3% to 4%. The likelihood that a baby in the breech position at 36 weeks will remain so until the time of birth is 25%. Spontaneous version to a cephalic (head first) presentation may occur at any time.

- Considered a medical indication for automatic cesarean section.

Postural Management of Breech Presentation

- Five studies involving a total of 392 women were included in a Cochrane review on the efficacy of postural management for changing a breech to a cephalic presentation.
- Includes the use of slant boards upon which the mother lies on her back, at a 45-degree angle with her head down, and other similar techniques that are thought to coax the baby to change position.
- The authors of the review concluded that there is insufficient evidence from well-controlled trials to support the use of postural management for breech presentation. The numbers of women studied to date, however, remains relatively small.

Breech

Hypnosis

- In a study by Mehl, 100 women with breech presentation between 37 weeks and term were compared with a similarly matched control group and achieved a version rate of 81% compared with 48% in the nonintervention group.
- It is thought that because psychophysiologic factors may influence breech presentation, relaxing the mother's abdominal musculature, or preparing her mentally and emotionally for delivery through the use of hypnotism or other techniques may assist in achieving cephalic version.
- There are no studies in the literature on the use of hypnosis for breech version.

Other

- Small non-randomized, noncontrolled studies and case reports suggest that there may be some small benefit to a variety of techniques for changing breech position. These include yoga, chiropractic, and homeopathic methods, as well as the use of ginger paste applied in place of moxibustion to stimulate heat to BL67.

Moxibustion for Breech

- TCM technique using rolled Artemisia “cigar” indirectly applied to BL 67 for 15 min BID, each foot for up to 7-10 days or stopped when fetus is cephalic.
- Fetal activity is observed to increase during the treatment period, followed by movement of the baby into a cephalic presentation.
- In a study by Cardini et al. published in JAMA in 1998, the authors reported that of 130 women with breech babies who received moxibustion beginning at 33 weeks gestation, 75.4% of babies were cephalic by 35 weeks gestation vs. 47.7% in the control group.
- A Cochrane Review reports no side effects associated with use of moxibustion in pregnancy.



Postdates Pregnancy + Induction

- One of the most commonly performed obstetrical procedures in the United States
- In 1990 the rate of labor induction in the US was less than 10%. By 2006, it was more than 23% of births, and is as high as 44% in some communities, according to the CDC.
- Reasons cited: widespread availability of cervical ripening agents, conveniences to physicians, pressure from patients, and legal constraints.
- While some are medically necessary, most are only marginally indicated and as many as 40% are unnecessary – or elective.
- Statistically, there is a slightly increased risk of stillbirth after 41 weeks of pregnancy. This small risk represents a major legal concern for doctors who deliver babies.
- Has become the “new norm” to the extent that many women *request* labor induction for personal convenience. Many pregnant women feel pressured to undergo induction.

Postdates Pregnancy

Validated Approaches (Cochrane Database)

[Evaluate Bishop score prior to induction attempts]

- Membrane stripping
- Nipple stimulation
- Intercourse

Botanicals commonly used

- Blue cohosh
- Cotton Root
- *EPO*
- RRL
- Castor oil



Nipple Stimulation

- 2005 Cochrane Review identified six trials with a total of 719 women. Analysis of trials comparing breast stimulation with no intervention found a significant reduction in the number of women not in labor at 72 hours. However, this result was only seen in women with a favorable cervix at the onset of stimulation.
- A major reduction in the rate of postpartum hemorrhage was reported (0.7% versus 6). There was no significant difference in the caesarean section rate (9% versus 10) nor in rates of meconium staining. There were no instances of uterine hyperstimulation. Three perinatal deaths were reported
- Chayen and Kim, in a clinical trial of 317 contraction stress tests using stimulation with an automatic breast pump found that contractions were successfully achieved in 84.2% of cases, with uterine hyperstimulation observed in 4.1% of tests performed. Side effects and complications were minimal.

- In another study by Chayen et al, nipple stimulation with an electric breast pump was compared with oxytocin infusion as a means of labor induction. The time from stimulation to the onset of regular uterine activity and to 200 Montevideo units of uterine activity and the time until entrance into the active phase of labor were significantly shorter in the nipple stimulation group. Once the women were in active labor, there was no difference between the groups in the length of labor or mode of birth.
- While nipple stimulation is not as effective oxytocin induction, it appears to be effective for many women, and may be considered a safe, effective alternative to try before turning to pharmaceutical or mechanical labor stimulation.



Membrane Stripping

- Stripping the membranes thought to release prostaglandin F2-alpha from the decidua and membranes, or prostaglandin E2 from the cervix, causing cervical ripening and instigating contractions.
- Widely utilized by OBs and midwives, In a meta-analysis of 22 trials (n=2797) 20 comparing sweeping of membranes with no treatment, three comparing sweeping with prostaglandins and one comparing sweeping with oxytocin, risk of caesarean section was similar between groups. Sweeping of the membranes, performed as a general policy in women at term, was associated with reduced duration of pregnancy and reduced frequency of pregnancy continuing beyond 41 weeks and 42 weeks.
- It is effective at preventing the need for formal induction in one out of eight women. No evidence of a difference in the risk of maternal or neonatal infection was observed. Discomfort during vaginal examination and other adverse effects (bleeding, irregular contractions) were more frequently reported by women allocated to sweeping.

- Studies comparing sweeping with prostaglandin administration are of limited sample size and do not provide evidence of benefit. The authors of the meta-analysis concluded that sweeping the membranes is effective in some women at inducing labor, and is generally safe in the absence of other complications, and reduces the need for other forms of induction, however, its rate of effectiveness seems limited.
- Weekly membrane stripping appears to shorten the interval of time to spontaneous labor at term, although improvement in pregnancy outcome has not been demonstrated by large, randomized trials.
- Risks of membrane stripping include premature rupture of membranes, infection, disruptions of occult placenta previa and rupture of vasa previa, though these are rare outcomes of this procedure.

Sexual Intercourse

- Prostaglandins have been extensively studied for their role in stimulating the onset of labor, particularly, ripening the cervix.
- Human semen is a rich biological source of prostaglandins, with a high prostaglandin concentration.
- The use of sex with intercourse to stimulate labor has become a modern “folk” tradition, and it is widely recommended amongst midwives when labor stimulation is required. The typical recommendation is intercourse 2-3 times daily, for 2-3 days in a row.
- It is uncertain whether any stimulating effects resulting from sexual intercourse are due to the mechanical stimulation of the lower uterine segment, the endogenous release of oxytocin as a result of orgasm, or from the direct action of prostaglandins in semen. Furthermore nipple stimulation may be part of the process of initiation if this occurs in the context of sexual activity. These various factors are very difficult to standardize for clinical studies in comparison to other interventions for labor induction.
- A Cochrane review identified one study of 28 women, from which the authors determined that no meaningful conclusions could be derived.
- As long as the membranes are intact, there is not placenta previa, and the mother is comfortable with this approach, there is no harm in incorporating intercourse into efforts to stimulate labor.

Castor Oil

- Castor oil is a potent cathartic extracted from the castor bean.
- Use of this herb to stimulate labor appears to date back to ancient Egypt.
- It remains a commonly used folk method to induce labor, and has made its way into obstetric practice, with its use common suggested by midwives.
- There is scant data evaluating its clinical efficacy. In the one clinical trial of a single dose of castor oil was compared with no treatment. There was no evidence of a difference between caesarean section rates, meconium staining of the amniotic fluid, nor Apgar score.
- No data were presented on neonatal or maternal mortality or morbidity.
- Nausea was a side effect in all women who ingested castor oil.
- Overall, the trial was of poor methodological quality and no determination can be made regarding efficacy for labor induction.

American Herbal Pharmacopoeia® and Therapeutic Compendium

Blue Cohosh Root and Rhizome

Caulophyllum thalictroides (L.) Michx.

C. giganteum (Farw.) Loconte & W. H. Blackw.

STANDARDS OF ANALYSIS, QUALITY CONTROL, AND
THERAPEUTICS

Editors

Aviva Romm MD CPM Herbalist
Tufts School of Medicine
Boston, MA

Roy Upton RH DAyu
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Scotts Valley, CA

Associate Editor

Pavel Axentiev MS
American Herbal Pharmacopoeia®
Scotts Valley, CA

Research Associate

Diana Swisher MA
American Herbal Pharmacopoeia®
Scotts Valley, CA



BLUE COHOSH

Table 12 Case reports of adverse effects of blue cohosh

Reference(s)	Case parameters	Intervention	Adverse effects	WHO causality category*	Discussion
Gunn and Wright (1996)	Planned homebirth at 41 weeks 6 days gestation following a midwife-attempted induction	Unspecified; mixture of blue cohosh and black cohosh	Absent spontaneous respirations at birth; multi-organ hypoxic injury; permanent central nervous system damage	Possible	Hypoxia due to post-term pregnancy and/or lengthy resuscitation are confounding factors.
Jones and Lawson (1998)	A 41-wk GA male infant delivered in hospital by a 36-year-old G4P3 with well-controlled hypothyroidism	3 tablets of blue cohosh (amount in tablet unspecified) daily for 3 weeks prior to due date as a <i>partus preparator</i>	Acute MI, profound CHF, and shock after a precipitous labor with spontaneous delivery; poor peripheral pulses, MR, gallop rhythm, hepatomegaly, deep q-waves on ECG, extensive regional wall motion abnormalities on echocardiogram	Possible	The mother reportedly took 3 times the dose recommended by the midwife; all other causes of MI and CHF were excluded, and the authors asserted a likely causal relationship.
Rao et al. (1998); Rao and Hoffmann (2002)	Abortion attempt: 21-year-old female at 5-6 weeks gestation	Blue cohosh tincture: 10-20 unspecified doses/day for 4 days; slippery elm tea: 15 cups/day for 4 days; slippery elm and parsley vaginal douches	Abdominal pain, bilious vomiting, tachycardia, hypertension, diaphoresis, abdominal fasciculations, mild low pelvic cramping	Probable	Causality was not definitively established but is highly plausible. This event should be considered as a result of overdose, not a typical adverse reaction to the botanical.
Finkel and Zarlengo (2004a)	Female born by c-section at ~40 weeks gestation after failed attempted vaginal delivery to a healthy 24-year-old G2P0	Tea; dose and duration unspecified	Focal motor seizures of the infant's right arm at 26 hours after birth; a CT obtained at two days of age showed evolving infarct in a left MCA distribution.	Possible	Initially attributed to blue cohosh thought to either be contaminated with or metabolized to benzoyllecgonine; this compound is not a metabolite of blue cohosh nor found in blue cohosh products, and the result was most likely due to a cross-reactivity in immunoassays performed compounded by a misreading of the GC-MS confirmation (Finkel and Zarlengo 2004b).

* Defined in WHO (2004). Categories assigned according to scores calculated from the Naranjo Adverse Drug Reaction Probability Scale (Naranjo et al. 1981): > 9 – certain or definite; 5-8 – probable; 1-4 – possible; 0 – unlikely.

Table 15 Estimated maximum daily intakes (mg) of alkaloids and saponins from blue cohosh products, based on information provided on the product labels

Product type	Alkaloids, mg	Saponins, mg	Publication reference
Capsules	15.6-47.8	76.5-190.3	Satchithanandam et al. (2008)
	—	115.6-161.84	Avula et al. (2011)
Liquid extracts	0.9-17.3	9.1-79.1	Satchithanandam et al. (2008)
	—	5.97-302.4	Avula et al. (2011)

Cotton Root Bark

- Historically an emmenagogue and abortifacient
- Ellingwood: specific for uterine inertia, to increase uterine contractions and also to prevent postpartum hemorrhage.
- Marketed by Lloyd Pharmaceuticals and Eli Lilly as an oxytocic, emmenagogic agent.
- The USP listed cotton root as a parturient from 1860 to 1880.
- Cardiotoxic and hepatotoxic effects have been reported in animals and *in vitro* with *gossypol*. Altered hormone levels and other metabolic effects have been mainly reported in animals and *in vitro* but are also reported in human studies as well.



- *Gossypol* is present in the seed in 0.5% concentration, and in lesser concentrations throughout the plant. The root bark extract (not *gossypol*) is used by herbalists as an emmenagogue in cases of amenorrhea and as a uterine antihemorrhagic.
- Used by midwives as an alternative or adjunct to blue cohosh as a labor stimulant in post-dates pregnancies, for PROM, or for stalled labor. No studies identified in the literature on use of whole plant extracts, nor the use of this herb for labor stimulation, thus the safety and efficacy of this herb as a labor stimulant cannot be determined.
- This herb may have teratogenic effects if taken during early pregnancy, and may induce abortion, so should not be used earlier in pregnancy than at the intended onset of labor.
- Generally given in tincture form, usually in combination with other uterine stimulants, and often antispasmodic herbs. Repeated doses of 2-3 mL every 2 hours will often result in contractions after 4-6 doses.

Red Raspberry leaf

- Historically venerated herbal tonic used during pregnancy to strengthen the uterus, improve labor outcome, and prevent excessive bleeding after birth.
- One study indicates that around 63% of US midwives use this herb to stimulate labor.
- While it does not appear that raspberry leaf is very effective for labor stimulation or shortening the duration of labor, research has found that drinking tea during pregnancy may improve labor outcome and reduce the need for medical intervention at birth.



- The results of a double-blind, randomized, placebo-controlled trial consisting of 192 low-risk, nulliparous women who birthed their babies between May 1999 and February 2000 at a large tertiary-level hospital in Sydney, Australia found that raspberry leaf, taken in tablet form from 32 weeks' gestation until labor caused no adverse effects for mother or baby, and while it did not shorten labor, a lower rate of forceps deliveries between the treatment group and the control group (19.3% vs. 30.4%) was observed.
- Another study consisted of 108 mothers; 57 (52.8%) consumed raspberry leaf products while 51 (47.2%) were in the control group. The findings suggested that raspberry leaf can be safely taken during pregnancy to shorten labor with no expected side effects. Also reported a decrease in likelihood of pre and post-term gestation, and fewer interventions including decreased amniotomy, caesarean section, forceps delivery, and vacuum extraction.
- Herbalists and midwives consider raspberry leaf to be a gentle, effective nutritive medicament, and recommend it be taken in the form of an infusion, 1-3 cups daily.
- Of all the herbs that might be considered for labor preparation, raspberry leaf products appear to be the safest.

EPO

- EPO is a rich source of essential fatty acids, especially gamma-linolenic acid (GLA), which function as precursors for prostaglandin synthesis.
- Evening primrose oil (EPO) is widely used by many midwives, both applied topically to the cervix and taken orally, to encourage cervical ripening in an effort to shorten labor and decrease the incidence of postdates pregnancies.
- Sparse data is available to support this use, though many midwives report it to be effective based on observational reports and anecdote



- One study was identified which investigated the effect of oral evening primrose oil on the length of pregnancy and selected intrapartum outcomes in low-risk nulliparous women. A two group retrospective quasi-experimental design conducted on a sample of women who received care in a birth center, compared selected outcomes of 54 women taking evening primrose oil in their pregnancy with a control group of 54 women who did not.
- Findings suggested that the oral administration of evening primrose oil from the 37th gestational week until birth did not shorten gestation or decrease the overall length of labor.
- Further, in this study, the use of orally administered evening primrose oil may have been associated with an increase in the incidence of prolonged rupture of membranes, oxytocin augmentation, arrest of descent, and vacuum extraction.
- Numerous studies of EPO have found no toxicity, and side effects are rare, including headache and gastrointestinal upset.



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