# PH-03 North America: Moerman's ethnobotany and the Eclectic physicians' materia medica

HEALING after the FALL, research library, PH-03

Researched 10 October 2026 by Claude Opus agent for THRIVING after the FALL, Book Four. Library document, unverified.

This report is written for a reader in North America, mainly the temperate east and the Pacific Northwest. It does not repeat the European pharmacopoeia (THRIVING library, PH-01), the lookalike rules (THRIVING library, PH-10), the hit-rate method (THRIVING library, TR-01), the rules on Indigenous and restricted knowledge (THRIVING library, SY-04) or the cranberry evidence (THRIVING library, IN-14). It points to them where they apply.

## Findings by section

### 1. The two records

**The Native record.** Daniel Moerman's *Native American Ethnobotany* (1998) gathers 44,691 uses of 4,029 plant taxa from 291 societies north of Mexico, each use tied to a named nation and a published source. Its searchable form is the Native American Ethnobotany Database at the Botanical Research Institute of Texas (BRIT 2026). I queried it for every plant in this report, and the counts below are mine from those queries. Moerman records use, not effect. A plant with 300 records is a plant that many people wrote down, which partly measures how many ethnographers visited (THRIVING library, TR-01).

In North America 2,428 of 20,669 species, 11.7 per cent, carry a medicinal use, and the choice is strongly non-random by family (Moerman et al. 1999, via THRIVING library, TR-01). Krochmal's 1973 list of North American medicinal plants tested active 26.7 per cent of the time against 10.4 per cent for a random screen (THRIVING library, TR-01).

**The Eclectic record.** The Eclectics were a sect of American physicians centred on the Eclectic Medical Institute in Cincinnati, who built their practice on native plants from about the 1830s to the 1930s [VERIFY dates]. Their summary texts are *King's American Dispensatory* (Felter and Lloyd 1898) and Harvey Wickes Felter's *Eclectic Materia Medica* (Felter 1922). Lloyd Brothers made their "specific medicines", concentrated tinctures dosed in drops. Felter is candid. He says when a remedy was over-praised and when a large dose killed. But the Eclectics were a school, not a trial. They had no control groups and wrote their own literature, so their confidence is experience and advocacy at once.

Virgil Vogel's *American Indian Medicine* (1970) is cited for about 170 drugs from peoples north of the Rio Grande that became official in the United States compendia. I found that figure only in a bookseller's description (Morgan's Rare Books, undated) [VERIFY].

**How a use travelled.** Echinacea reached Cincinnati in 1885, when H. C. F. Meyer of Pawnee City, Nebraska, sent the root of his patent "Blood Purifier" to John Uri Lloyd, and Curtis Lloyd identified it as *Echinacea angustifolia*. Meyer claimed it cured rattlesnake bite and offered to be bitten before Cincinnati physicians, who declined (Lloyd

1917, read through a search summary). A Plains use passed through a patent-medicine seller to the Eclectics and then to the supplement trade, changing meaning at each step.

**2. The steer's six**

**2.1 Echinacea (*Echinacea angustifolia*, *E. pallida*, *E. purpurea*), Asteraceae** **Traditional claim.** *E. angustifolia* has 84 records from 12 Plains nations, led by the Omaha (16), Winnebago (11), Dakota, Pawnee and Ponca (10 each). The leading categories are analgesic (13), toothache (11), burn dressing (11) and snakebite (7). As recorded by the Blackfoot in Johnston 1987, the root was chewed to numb toothache. As recorded by the Cheyenne in Grinnell 1972, an infusion treated sore mouth, gums and throat. *E. pallida* has 28 records, 15 Northern Cheyenne (Hart 1981), including burns, rheumatism and a root chewed for colds. *E. purpurea*, the species of the modern cold market, has five records: Choctaw use for cough and dyspepsia (Campbell 1951) and Delaware use for venereal disease (Tantaquidgeon 1942, 1972). All via BRIT 2026. Across the three species, 4 of 117 records concern coughs or colds.

**Eclectic record.** Felter used *E. angustifolia* root at 1 to 60 drops, preferring 1 to 5 drops often repeated, for sepsis, boils, gangrene and snakebite. He found no reliable human deaths. He wrote that it had been "lauded extravagantly" and that relying on it alone in malignant diphtheria was "leaning upon a slender reed" (Felter 1922). He did not use it for the common cold.

**Modern inference.** The Cochrane review pooled 24 trials with 4,631 participants. None of 12 prevention comparisons was significant alone, post hoc pooling suggested a 10 to 20 per cent relative risk reduction, and one of seven treatment trials was positive (Karsch-Völk et al. 2014, abstract read). In 407 children aged 2 to 11, *E. purpurea* did not shorten 707 colds (P = 0.89) and caused rash in 7.1 against 2.7 per cent (P = 0.008) (Taylor et al. 2003, abstract read). A 2024 meta-analysis of 30 trials reported fewer infections (risk ratio 0.68) and fewer antibiotic courses (Gancitano et al. 2024, abstract read), with possible manufacturer links [VERIFY]. The European Medicines Agency lists fresh *E. purpurea* herb pressed juice as well-established use for short-term prevention and treatment of colds: 1.5 to 4.5 ml a dose, 6 to 9 ml a day, at most 10 days, not under 12, not with Asteraceae allergy, autoimmune disease or immunodeficiency (EMA 2015).

**Verdict.** *E. purpurea* juice for adult cold prevention: grade B, small and contested. For children's colds: grade X. *E. angustifolia* root chewed for toothache and sore mouth: grade C, convergent across Plains nations, with the tingling numbness of its alkylamides as a plausible mechanism [VERIFY]. For snakebite or sepsis: grade D, never in place of other care.

**2.2 Goldenseal (*Hydrastis canadensis*), Ranunculaceae** **Traditional claim.** Twenty records from three nations. As recorded by the Cherokee in Hamel and Chiltoskey 1975, it was used for cancer, appetite, dyspepsia and as a wash for local inflammation. As recorded by the Iroquois in Herrick 1977, it served for whooping cough, diarrhoea, and as ear and eye drops (BRIT 2026).

**Eclectic record.** Felter combined a colourless hydrastis preparation with witch hazel as an eye lotion for acute conjunctivitis and as ear drops. In his barberry entry he offered *Berberis vulgaris* for many uses of "that scarce and high-priced drug" (Felter 1922). I did not read his goldenseal entry, so no Eclectic dose is given [VERIFY].

**Modern inference.** The NCCIH finds no condition with sufficient evidence. Goldenseal lowered metformin levels by about 25 per cent, studies used about 3 g a day, and it is not to be used in pregnancy, breastfeeding or infancy because berberine can harm newborns (NCCIH 2025a). Berberine inhibits CYP3A4, CYP2D6 and CYP2C9, raised ciclosporin exposure by 34.5 per cent, and carries risks of low blood sugar and QT prolongation (Dumitru et al. 2026, abstract read).

**The plant.** CITES Appendix II since 18 September 1997 for roots and rhizomes (Forest Farming Extension, undated). United Plant Savers lists it as At-Risk and reports a mean of 63,797 pounds of dried wild root harvested yearly from 1999 to 2010. Digging kills the plant (United Plant Savers, undated).

**Verdict.** Grade D for every use, C at most as an astringent wash by analogy with other berberine plants. It must not be the book's berberine source. Oregon grape and barberry carry the same alkaloid and are common (section 3.10).

**2.3 Witch hazel (*Hamamelis virginiana*), Hamamelidaceae Traditional claim.** Thirty-nine records from six nations: Iroquois (21), Cherokee (8), Menominee, Chippewa, Mohegan and Potawatomi. As recorded by the Cherokee in Hamel and Chiltoskey 1975, an infusion washed sores and skinned places and the leaves were rubbed on scratches (BRIT 2026).

**Eclectic record.** Felter gave leaves, bark and twigs at 5 to 60 grains (0.3 to 3.9 g) as an astringent, and used it in eye and ear lotions (Felter 1922).

**Modern inference.** The 2019 EMA bark monograph grants traditional use only. For minor skin inflammation, a tincture at 5 to 10 per cent in a cream. For haemorrhoid itching and burning, a decoction of 5 to 10 g in 250 ml as soaked dressings up to three times a day. As a gargle, a decoction of 2 to 3 g up to three times a day. Not under 12, not under 18 for haemorrhoids, and see a doctor after one week (two for haemorrhoids) or with rectal bleeding (EMA 2019). The sources differ on route: EMA external, Felter internal. Shop witch hazel is usually a steam distillate, a different product with its own monograph and probably little tannin [VERIFY].

**Verdict.** Grade C as an external astringent and gargle. Worth growing.

**2.4 Slippery elm (*Ulmus rubra*), Ulmaceae Traditional claim.** One hundred and ten records from 19 nations, 54 medicinal. As recorded by the Cherokee in Hamel and Chiltoskey 1975, the inner bark was poulticed on burns, old sores and wounds. As recorded by the Chippewa in Densmore 1928, a decoction was gargled for sore throat. The Iroquois chewed the raw bark (Herrick 1977). All via BRIT 2026.

**Eclectic record.** Felter used the inner bark, "Dose, Ad libitum", as a demulcent for mouth, throat and gut and "one of the best agents to use after poisoning by irritants". He insisted the mucilage be made with very cold water, and said poultices "should not be applied to open surfaces" (Felter 1922).

**Modern inference.** No trial found. The mucilage coats an irritated surface, as marshmallow does (THRIVING library, PH-01). It delays absorption of oral medicines, so space them by an hour (Natural Medicines, via search summary). Its United States regulatory status is reported inconsistently [VERIFY]. United Plant Savers lists it as At-Risk. Girdling, Dutch elm disease and elm yellows kill the tree (United Plant Savers, undated).

**Verdict.** Grade C as a demulcent for throat, cough and irritated gut. Take bark from fallen or felled trees or from limbs, never by girdling.

**2.5 Black cohosh (*Actaea racemosa*, syn. *Cimicifuga racemosa*), Ranunculaceae Traditional claim.** Twenty-six records from six nations, 16 Cherokee. As recorded by the Cherokee in Hamel and Chiltoskey 1975 and Witthoft 1947, it was used to bring on menstruation and as a root "in spirits" for rheumatic pain. As recorded by the Iroquois in Herrick 1977, an infusion promoted milk flow (BRIT 2026).

**Eclectic record.** Felter gave the rhizome at 1 to 20 grains and Specific Medicine Macrotys at a tenth of a drop to 20 drops. Full doses caused a bursting frontal headache, large ones vertigo, blurred vision and nausea, and "no deaths have been known". He paired it with boneset for the aching of influenza (Felter 1922).

**Modern inference.** The Cochrane review (16 trials, 2,027 women, median 40 mg a day) found no difference from placebo in hot flushes (mean difference 0.07 a day, minus 0.43 to 0.56) and judged the evidence insufficient (Leach and Moore 2012, abstract read). The EMA nonetheless lists named dry extracts (for example 2.8 mg once or twice daily, or 5 mg a day) as well-established use for flushes and sweating, at most six months, not in pregnancy or lactation, stopping at any liver sign, with one committee member dissenting (EMA 2018). On the liver, the US Pharmacopeia rated 30 case reports all "possible" (Mahady et al. 2008, abstract read), Teschke judged nearly all unlikely (Teschke et

al. 2009, abstract read), and five trials with 1,117 women showed no enzyme change (Naser et al. 2011, abstract read). A 2025 review counts over 100 constituents, marked product variation and laboratory genotoxicity (Le et al. 2025, abstract read). Products have contained the wrong herb, and blue cohosh (*Caulophyllum thalictroides*), a different plant, has been linked to heart and seizure harms in newborns when used for labour (NCCIH 2025b).

**Verdict.** Household root for flushes: grade X on the pooled trials. The listed extracts: contested B, and no village can make them. Rheumatic pain: grade D. Not a village priority.

**2.6 Bloodroot (*Sanguinaria canadensis*), Papaveraceae** **Traditional claim.** One hundred and thirty-three records from 20 nations, led by the Iroquois (52) and Ojibwa (16), with skin uses first (13). As recorded by the Cherokee in Hamel and Chiltoskey 1975, it washed ulcers and sores. As recorded by the Iroquois in Herrick 1977, it was applied to sores and leg ulcers and chewed for sore throat (BRIT 2026).

**Eclectic record.** Felter gave 1 to 5 grains as an expectorant and marked emetic doses as not used. Lethal doses killed "by paralysis of medullary, respiratory, and cardiac centers", sometimes after convulsions. A poultice with slippery elm was a domestic remedy for chilblains, and a vinegar decoction had been endorsed for eczema, ringworm and warts. He called the plant "rapidly becoming scarce" (Felter 1922).

**Modern inference.** Bloodroot with zinc chloride is "black salve", sold to burn off skin cancers. The FDA calls these corrosive agents that destroy healthy and diseased tissue alike (FDA 2021). A review found no objective evidence of benefit (Eastman et al. 2014, abstract read). Australian pathology from 2015 to 2019 covered 409 patients and 475 lesions: 18 per cent were benign, and cancer persisted in 34.2 per cent of the rest, under destroyed normal tissue (Croaker et al. 2023, abstract read). The FDA logged disfigurement cases (Thambi et al. 2020, abstract read). Sanguinarine toothpaste and mouthwash were linked to oral leukoplakia (Eversole et al. 2000, Allen et al. 2001, abstracts only), a link an industry-linked review disputed (Munro et al. 1999, abstract only).

**Verdict.** Escharotic for cancer, warts or moles: grade X. Expectorant: grade D with a narrow margin. Never put bloodroot in a salve, and never use black-salve vendor pages as sources.

### 3. The Eclectic staples and shared Native staples

**3.1 Wild cherry bark (*Prunus serotina*), Rosaceae** **Traditional claim.** One hundred and eight records from 18 nations, led by the Iroquois (24), Cherokee (20) and Chippewa (12), with colds (13) and coughs (10) first. As recorded by the Cherokee in Hamel and Chiltoskey 1975, a bark infusion treated colds and coughs (BRIT 2026). This is the clearest North American cough remedy by consensus.

**Eclectic record.** Felter gave autumn stem bark at 5 to 60 grains (0.3 to 3.9 g) as a cough sedative acting much like hydrocyanic acid. The cold infusion was best, boiling destroyed its value, and the active principle was amygdalin, which yields hydrocyanic acid through an enzyme destroyed by heat (Felter 1922). *King's* gives the official cold infusion as 40 g bark to 1,000 ml, dose 30 to 90 ml three or four times a day, and elsewhere 1 ounce to a pint, about 60 g a litre (Felter and Lloyd 1898, read through a search summary). The two differ by half.

**Modern inference.** The effect is the cyanide. *King's* reports bark yields of 0.05 per cent hydrocyanic acid in April rising to 0.14 per cent in October (Perot 1852) and up to 0.34 per cent (Stevens and Judy 1895), that is 0.5 to 3.4 mg a gram (Felter and Lloyd 1898, via search summary). A draft US profile puts the human oral lethal dose near 1.52 mg per kg, with deaths reported from 0.7 mg per kg (ATSDR draft, via search summary) [VERIFY final figures]. My arithmetic [VERIFY]: Felter's top dose could release about 13 mg, which is 0.7 mg per kg for a 19 kg child. Infusion release is probably lower than distillation yield, but the margin for a child is too thin. Wilted leaves are the most toxic part and kill sheep at 0.18 to 0.72 pounds (Purdue University, undated). No trials exist.

**Verdict.** Grade C for adult cough, with the hazard as the mechanism. Autumn bark, dried, cold-infused, low dose, adults only. Never leaves or seeds, never children.

**3.2 Boneset (*Eupatorium perfoliatum*), Asteraceae** **Traditional claim.** Sixty-nine records from 17 nations, led by the Iroquois (20), Cherokee (12) and Mohegan (10), mainly for fever (11) and colds (7) (BRIT 2026).

**Eclectic record.** Felter gave 5 to 60 grains, the hot infusion as a sweat-inducer and in large doses as an emetic, for influenza and malaria, and wrote that it "has no poisonous or depressing qualities" (Felter 1922).

**Modern inference.** Forty-nine boneset samples contained dehydropyrrolizidine alkaloids, the liver toxins of comfrey, at 0.0002 to 0.07 per cent, with high levels in tinctures and hot infusions, and some samples were hybrids or mixtures. The authors urged caution (Colegate et al. 2018, abstract read). No clinical trial was found. Felter is contradicted.

**Verdict.** Grade C for a feverish cold, with an unseen toxin. A few cups in one acute illness in an adult at most. Never in pregnancy, breastfeeding, childhood or liver disease, never daily.

**3.3 Lobelia (*Lobelia inflata*), Campanulaceae** **Traditional claim.** Twenty records, Cherokee (10) and Iroquois (9). As recorded by the Cherokee in Hamel and Chiltoskey 1975, it was a strong emetic and a poultice for aches, stiff neck, bites and boils, and was smoked to break the tobacco habit (BRIT 2026). Ceremonial records exist and are not reproduced here (THRIVING library, SY-04).

**Eclectic record.** Samuel Thomson, who brought lobelia into American practice, was tried in Massachusetts in 1809 over the death of Ezra Lovett after lobelia emetics and acquitted. Accounts differ on the date of death, the grounds of acquittal and whether the exhibit was lobelia at all (Wikipedia 2026, Bergner undated, both read through search summaries). Felter pushed small doses to nausea and vomiting, warned that large doses paralyse breathing and that its injudicious use could kill, and forbade it as an emetic for children and the frail (Felter 1922).

**Modern inference.** Herbal references put toxicity at 0.6 to 1 g of leaf and death at about 4 g, extrapolated rather than drawn from cases, and the FDA ended over-the-counter lobeline as a smoking deterrent in 1993 for lack of effect (drugs.com, via search summary) [VERIFY]. I found no modern series of deaths. The nausea and the harm come from the same nicotine-like alkaloid.

**Verdict.** Grade X. Do not grow it.

**3.4 Mayapple (*Podophyllum peltatum*), Berberidaceae** **Traditional claim.** Thirty-nine records, Iroquois (13) and Cherokee (12) first, mostly as a purgative. Both the Cherokee and the Iroquois recorded the root as poisonous (Hamel and Chiltoskey 1975, Herrick 1977, via BRIT 2026).

**Eclectic record.** Felter gave the rhizome at 5 to 30 grains and podophyllin, the resin isolated by John King, at a thirtieth to half a grain. Large doses caused "violent emeto-catharsis and gastro-enteritis" and deaths, and it was called "vegetable mercury". He gave a podophyllin trituration to "very young babies" for constipation and in the summer diarrhoea of children (Felter 1922). That was a confident harm.

**Modern inference.** Purified podophyllotoxin is a real drug. A 0.3 or 0.5 per cent cream cured 41 of 60 women with genital warts against none of 20 on placebo (Syed et al. 1994, abstract read), and a placebo-controlled trial in men agrees (von Krogh et al. 1994, title only). Crude 25 per cent resin is limited to under 10 square centimetres and 0.5 ml a session, washed off within one to four hours, never on broken skin, never in pregnancy because of fetal death and birth defects (PDR, via search summary). Poisonings include coma after skin application in a girl of 16 (Slater et al. 1978), resin mistaken for cough linctus (Holdright and Jahangiri 1990) and a fatal overdose (Oliveira et al. 1996), all abstracts read.

**Verdict.** Root by mouth: grade X. Purified podophyllotoxin for warts: grade A, a pharmacy product. Crude resin: a district infirmary decision under the limits above.

**3.5 Cascara (*Frangula purshiana*, syn. *Rhamnus purshiana*), Rhamnaceae** **Traditional claim.** Sixty-two records from 32 nations, almost all Pacific Northwest and Plateau, with laxative (22) and cathartic (8) uses first. As recorded by the Nuxalk (Bella Coola) in Turner 1973, a bark infusion was a strong laxative (BRIT 2026).

**Eclectic record.** Felter gave the bark at 5 to 30 grains (0.3 to 1.9 g) and called it "an efficient purgative in pregnancy" (Felter 1922). That is now reversed.

**Modern inference.** The EMA grants well-established use for short-term occasional constipation: 10 to 30 mg hydroxyanthracene derivatives once at night, the smallest effective dose, as a tea of at most 30 mg in 150 ml boiling water, for no more than a week and usually two or three doses. Contraindicated under 12, in pregnancy and lactation (EMA 2020). The FDA removed cascara from over-the-counter laxatives by a rule of 9 May 2002, effective 5 November 2002, because no cancer or genotoxicity data were submitted, not because harm was shown (FDA 2002). Fresh bark causes griping and vomiting and must be aged a year or heated (drugs.com, via search summary) [VERIFY with a pharmacopoeia]. A household cannot assay hydroxyanthracenes, so Felter's weights are the only household measure [VERIFY their milligram equivalent].

**Verdict.** Grade B for occasional adult constipation, aged bark, one week at most. Plant it in the Northwest.

**3.6 American ginseng (*Panax quinquefolius*), Araliaceae** **Traditional claim.** Seventy-four records from 15 nations, Iroquois (21), Seminole (13) and Cherokee (9) first, mainly as a tonic (BRIT 2026).

**Eclectic record.** Felter gave 5 to 60 grains and noted it was "becoming exceedingly scarce" (Felter 1922).

**Modern inference.** In 323 Edmonton adults, two capsules a day of a polysaccharide extract for four months lowered colds per person from 0.93 to 0.68 and the share with two or more colds from 22.8 to 10.0 per cent, with 279 analysed (Predy et al. 2005, abstract read). Ten trials of Asian and American ginseng gave a risk ratio of 0.69 (0.52 to 0.90) with limited evidence (Antonelli et al. 2020, abstract read). The tested product is an extract, not root tea. Ginseng hunting is how two Maine brothers met water hemlock in 1992 (THRIVING library, PH-10).

**Verdict.** Extract for cold prevention: grade B, not makeable. Root as tonic: grade D. Grow it in shade for trade. Never dig wild "ginseng" from wet ground.

**3.7 Cranberry (*Vaccinium macrocarpon*), Ericaceae** The database records cranberry mainly as food, with one medicinal record of 11 (BRIT 2026). Prevention of recurrent cystitis in women is grade A (THRIVING library, IN-14). Its strong evidence came from neither record.

**3.8 Conifer resins: balsam fir (*Abies balsamea*), spruces, pines** **Traditional claim.** Balsam fir has 87 records from 15 nations, led by the Iroquois (12), Micmac (11) and Woodland Cree (9), with skin uses first (13). As recorded by the Algonquin of Quebec in Black 1980, the gum was poulticed on sores, bites and boils. As recorded by the Menominee in Densmore 1932, gum from bark blisters went on sores (BRIT 2026).

**Eclectic record.** Felter's hemlock spruce (*Tsuga canadensis*) entry gives Specific Medicine at 5 to 60 drops and the oil on boiling water as "a time-honored inhalation for croup" (Felter 1922).

**Modern inference.** The trials are for Norway spruce (*Picea abies*). In 11 Finnish primary care hospitals, 37 patients with pressure ulcers received resin salve or hydrocolloid. Among completers, ulcers healed in 12 of 13 on resin (92 per cent) against 4 of 9 (44 per cent), P = 0.003, but only 22 completed (Sipponen et al. 2008, abstract read). The Cochrane review of antiseptics for pressure ulcers found each comparison rested on one small trial (Norman et al. 2016, abstract read). A commercial salve contains 10 per cent resin (Yamileva and Multia 2025, preprint abstract), and contact allergy is reported (Yang et al. 2026, title only). Transfer to fir and pine is my inference [VERIFY], supported by shared resin acids and by convergent Cree, Micmac, Abenaki and Scandinavian use (Jokinen and Sipponen 2016, abstract read).

**Verdict.** Spruce resin salve for chronic wounds: grade B. Fir and pine resin: grade C by transfer. One of the most useful preparations in the region.

**3.9 Poplar buds (*Populus balsamifera*, balm of Gilead), Salicaceae** One hundred and seventy-three records from 48 nations, the widest spread here, with skin uses first (30). As recorded by the Algonquin of Quebec in Black 1980, a salve of the buds went on open sores (BRIT 2026). Felter gave aspen bark (*P. tremuloides*) at 1 to 30 grains and named populin and salicin in it (Felter 1922). I did not read his bud entry, and found no trial. **Verdict:** grade C for a bud salve on minor wounds, avoided by those allergic to aspirin, propolis or Peru balsam [VERIFY].

**3.10 Oregon grape (*Mahonia aquifolium*), Berberidaceae** Fifty-eight records from 20 nations of the Northwest and Plateau, led by the Thompson (11) and Okanagan-Colville (7), as blood and eye medicine (BRIT 2026). Five of seven psoriasis trials of topical Mahonia were positive (Janeczek et al. 2018, abstract read), and a 2025 review called it promising (Anheyer et al. 2025, abstract read). The cream strength was commonly 10 per cent [VERIFY]. **Verdict:** grade B for mild psoriasis as a cream, C for other berberine uses, and the book's preferred berberine plant. By mouth, the berberine cautions of section 2.2 apply.

**3.11 Jewelweed (*Impatiens capensis*), Balsaminaceae** Forty-five records from 14 nations. As recorded by the Potawatomi in Smith 1933, fresh juice washed nettle stings and poison ivy, and the Cherokee used it the same way (BRIT 2026). Felter: fresh juice relieves poison ivy dermatitis "if used early" (Felter 1922). In 10 volunteers, jewelweed extract after urushiol did no better than water (Long et al. 1997, abstract read). In 23 volunteers, jewelweed extract, plant mash and every soap tested, with or without jewelweed, reduced the rash (Motz et al. 2015, abstract read). **Verdict:** grade X once a rash has appeared. Early washing is grade B, but the active is the washing, and soap does it at least as well.

**3.12 Sassafras (*Sassafras albidum*), Lauraceae** One hundred and two records from 13 nations, 42 of them Mikasuki Seminole (Sturtevant 1954), 18 Cherokee and 16 Iroquois (BRIT 2026). Felter gave root bark at 1 to 3 drachms and the oil at 1 to 15 drops, and noted the infusion as a domestic remedy for poison ivy (Felter 1922). The FDA banned safrole and oil of sassafras from food by an order of 3 December 1960, after safrole caused liver cancer in rats, now 21 CFR 189.180 (Cornell Legal Information Institute, current). **Verdict:** grade X. Do not drink it.

**3.13 Yarrow (*Achillea millefolium*), Asteraceae** Yarrow has 366 records from 77 nations, the most of any plant here, with skin and wound uses first (53) (BRIT 2026). Felter gave 5 to 30 drops (Felter 1922). The European evidence, grade C, applies unchanged (THRIVING library, PH-01). Its flat white heads are why it is checked against hemlock and water hemlock every time (THRIVING library, PH-10).

### 4. The hit rate, and what the Eclectics kept

A true hit rate would screen a random sample of the 2,428 medicinal species against a random sample of the flora (THRIVING library, TR-01). That has not been done for North America as a whole. The best published figures remain Krochmal's 26.7 against 10.4 per cent, a ratio of about 2.6, and Kindscher's prairie anti-HIV screen of 60.0 against 13.9 per cent (THRIVING library, TR-01).

My own tally across the 20 plants, matching each plant's leading Native use to the modern evidence for that use, is an illustration on a famous and so survivor-biased list, not an estimate [VERIFY].

| Leading Native use | Count | Plants |
|---|---|---|
| Benefit shown (A or B) | 2 | cascara, conifer resin (by transfer) |
| Real effect, harm outweighs | 3 | bloodroot, lobelia, mayapple |

| Leading Native use | Count | Plants |
|---|---|---|
| Plausible, convergent, untested (C) | 7 | witch hazel, slippery elm, wild cherry, boneset, poplar, yarrow, *E. angustifolia* |
| Single tradition or unsupported (D) | 4 | *E. purpurea*, goldenseal, ginseng, black cohosh |
| Shown not to work or harmful (X) | 3 | jewelweed after rash, sassafras, black cohosh root for flushes |
| No medicinal tradition | 1 | cranberry |

The leading use was confirmed with benefit for 2 of 19, about 1 in 10, and showed a real pharmacological action, good or bad, for 5 of 19, about 1 in 4, close to Krochmal's figure. Several of the strongest modern results came from uses no tradition recorded: cranberry for cystitis, podophyllotoxin for warts, ginseng extract for colds, Mahonia for psoriasis. The tradition pointed to the right plants more often than to the right use.

The Eclectics kept all 19 plants with a Native medicinal record. They dropped none of the harmful ones. Felter recorded the dangers of lobelia, bloodroot and mayapple and preferred the cold cherry infusion, but called boneset non-poisonous, cascara fit for pregnancy and podophyllin fit for babies. A century of practice refined doses and recorded toxic signs. It did not remove harmful plants, did not see slow harms like pyrrolizidine liver damage or safrole cancer, and could not tell a real effect from colds and fevers ending on their own. The filter that removed sassafras, lobeline and cascara's licence came from regulators and controlled trials after the Eclectic schools closed. The Eclectic record can be mined for doses, preparations and toxic signs, not for efficacy.

### 5. Lookalikes, restricted knowledge, exclusions

**Lookalikes.** The umbellifer rule is absolute. Water hemlock (*Cicuta maculata*) grows in the wet ground where ginseng hunters and parsnip gatherers walk, and a small piece of root can kill (THRIVING library, PH-10). Yarrow resembles hemlock from a distance but has feathery leaves and is never gathered from wet ground. False hellebore (*Veratrum viride*) beside ramps is the lily trap of the eastern spring (THRIVING library, PH-10), and ramp gatherers walk the same woods as cohosh and goldenseal diggers. Within this list:

- Black cohosh against blue cohosh, different families and hazards, and against baneberries (*Actaea rubra*, *A. pachypoda*), whose berries are poisonous [VERIFY].
- Wild cherry against chokecherry (*P. virginiana*): *King's* records the confusion of names (Felter and Lloyd 1898). Both are cyanogenic, so the same rules apply.
- Boneset against other *Eupatorium* and hybrids, which change alkaloid content (Colegate et al. 2018).
- Slippery elm against American elm, whose bark is less mucilaginous [VERIFY].

**Restricted knowledge.** Several nations whose plants appear here keep some medicine within societies or ceremonies, for example the Anishinaabe Midewiwin and Haudenosaunee medicine societies [VERIFY]. The database also holds ceremonial records for lobelia. These exist and are not reproduced (THRIVING library, SY-04). Where outsiders published restricted material without consent, this book does not republish it.

**Excluded.** Tobacco and peyote belong to consent and to ceremony, not to a dose table (THRIVING library, SY-04).

### 6. The ranked table

Ranked by usefulness to a village, weighing evidence, ease of growing and margin of error. Adult doses unless stated. One grain is 64.8 mg.

| Rank | Plant, part | Preparation | Use | Grade | Dose, tolerance | Harms, who must never | Lookalikes |
|---|---|---|---|---|---|---|---|
| 1 | Spruce, fir, pine resin | Salve, 10% resin | Chronic wounds, pressure sores | B spruce, C others | Thin layer, change every 1 to 3 days [VERIFY] | Contact allergy | Yew (PH-10) |
| 2 | Cranberry, fruit | Juice, fruit | Recurrent cystitis prevention | A | IN-14 | Not as treatment | None |
| 3 | Witch hazel, bark | Decoction | Skin, haemorrhoids, gargle | C | 5 to 10 g in 250 ml compress, 2 to 3 g gargle, up to 3x daily (EMA). Felter 0.3 to 3.9 g | Under 12, under 18 for haemorrhoids. Rectal bleeding | Few |
| 4 | Slippery elm, inner bark | Cold mucilage, poultice | Throat, cough, gut | C | Ad libitum (Felter). 1 to 3 g in 150 ml by transfer [VERIFY] | Space medicines 1 h. Never girdle | American elm |
| 5 | Cascara, aged bark | Tea | Occasional constipation | B | 10 to 30 mg hydroxyanthracenes (EMA), 0.3 to 1.9 g bark (Felter), max 1 week | Fresh bark. Under 12, pregnancy, lactation, obstruction | Other buckthorns |
| 6 | Oregon grape, root bark | Cream, wash | Mild psoriasis | B topical | Cream about 10% [VERIFY] | By mouth: pregnancy, newborns, interacting drugs | None toxic |
| 7 | Yarrow, herb | Infusion, poultice | Minor wounds, digestion | C | PH-01 | Asteraceae allergy, pregnancy | Hemlock, water hemlock |
| 8 | Wild cherry, autumn bark | Cold infusion | Adult dry cough | C | 1 to 2 g a dose, 3x daily, 3 days [VERIFY] | Cyanide. Never children, pregnancy, leaves, seeds | Chokecherry, same rules |

| Rank | Plant, part | Preparation | Use | Grade | Dose, tolerance | Harms, who must never | Lookalikes |
|---|---|---|---|---|---|---|---|
| 9 | Poplar buds | Salve | Minor wounds | C | External | Aspirin, propolis allergy [VERIFY] | None |
| 10 | *E. purpurea*, fresh herb | Pressed juice | Adult cold prevention | B contested | 1.5 to 4.5 ml a dose, 6 to 9 ml daily, 10 days | Under 12, Asteraceae allergy, autoimmune | None |
| 11 | *E. angustifolia*, root | Chewed | Toothache, sore mouth | C | Small piece held [VERIFY] | Asteraceae allergy | None |
| 12 | Boneset, top | Hot infusion | Feverish cold | C, toxin | 0.3 to 3.9 g (Felter), one illness only [VERIFY] | Pyrrolizidines. Pregnancy, children, liver disease | Other *Eupatorium* |
| 13 | Ginseng, root | Extract | Cold prevention | B extract, D root | Not makeable | Rare plant | Water hemlock |
| 14 | Black cohosh, rhizome | Extract | Flushes | X root, B contested extract | EMA extracts 5 to 5.6 mg daily, 6 months | Liver signs, pregnancy | Blue cohosh, baneberries |
| 15 | Goldenseal, rhizome | Wash | Inflamed skin, eyes | D | Not given | Endangered. Pregnancy, infants, interactions | None |
| 16 | Jewelweed, fresh | Crushed, rubbed | Washing off poison ivy | X after rash, soap better | Within the first hour | None notable | None |
| 17 | Mayapple, resin | Podophyllotoxin (pharmacy) | Genital warts | A purified, X root | Crude resin under 10 cm2, 0.5 ml, off in 1 to 4 h | Never by mouth, pregnancy, broken skin | None |
| 18 | Bloodroot | None | None | X salve, D expectorant | Do not use | Disfigurement, persisting cancer | None |
| 19 | Lobelia | None | None | X | Do not use | Respiratory paralysis | Other *Lobelia* |
| 20 | Sassafras | None | None | X | Do not use | Rat liver carcinogen | None |

### 7. What a village should grow

Witch hazel at the woodland edge, planted slippery elm, cascara in the Northwest, Oregon grape in the west and barberry elsewhere, yarrow, both echinaceas in sunny beds, cranberry on acid wet ground, and conifers for resin. Ginseng and goldenseal in deep shade if stock can be had, for conservation and trade. Do not plant lobelia, sassafras or bloodroot, and teach children mayapple and the cohoshes by sight.

## Evidence grades

| Grade | Plant and use |
|---|---|
| A | Cranberry for recurrent cystitis (IN-14). Podophyllotoxin for genital warts (Syed 1994) |
| B | Spruce resin salve for pressure ulcers (Sipponen 2008). Cascara for occasional constipation (EMA 2020). Mahonia cream for psoriasis (Janeczek 2018). Ginseng extract for cold prevention (Predy 2005). *E. purpurea* juice for adult cold prevention, contested (Karsch-Völk 2014, EMA 2015). Early washing after poison ivy (Motz 2015) |
| C | Witch hazel compress and gargle. Slippery elm demulcent. Wild cherry for adult cough. Boneset for feverish colds, with toxin. Poplar bud salve. Fir and pine resin by transfer. *E. angustifolia* for mouth pain. Yarrow (PH-01) |
| D | Goldenseal, all uses. Ginseng root as tonic. Black cohosh for rheumatism. Bloodroot as expectorant |
| X | Black cohosh root for flushes (Leach 2012). *E. purpurea* for children's colds (Taylor 2003). Jewelweed after rash (Long 1997). Bloodroot salve (Croaker 2023). Lobelia. Mayapple root by mouth. Sassafras (FDA 1960) |

## Means ledger

| Remedy | Hands | Hearth | Garden and still | Village (300) | District (3,000) | Hospital before the Fall |
|---|---|---|---|---|---|---|
| Resin salve | Raw gum on a wound | Resin in fat and wax | Fixed 10% recipe, labelled | Dressing schedule, records | Debridement plus salve | Modern dressings, grafts |
| Witch hazel | Crushed leaf | Decoction, compress | Bark stock by weight | Standard dressing | Examination for bleeding | Proctoscopy, banding |
| Slippery elm | Chew bark | Cold mucilage | Planted trees | Demulcent | Same, plus diet | Lozenges, endoscopy |
| Cascara | None | Aged-bark tea | Year-aged bark store | One-week courses | Rule out obstruction | Osmotic laxatives |

| Remedy | Hands | Hearth | Garden and still | Village (300) | District (3,000) | Hospital before the Fall |
|---|---|---|---|---|---|---|
| Wild cherry | None | Cold infusion, adults | Autumn bark by weight | Adults only, labelled | Same | Cough suppressants, X-ray |
| *E. purpurea* | None | Same-day juice | Juice in alcohol [VERIFY] | Optional, adults | Same | Not used |
| Podophyllin | None | None | None | Refer | Crude resin, strict limits | Pharmacy cream, cryotherapy |
| Bloodroot, lobelia, sassafras, mayapple root | Recognise and leave | Never | Never | Teach recognition | Treat poisoning | Intensive care |

## Harm test

**Deadly at household doses.** Mayapple root or resin by mouth, lobelia as an emetic, bloodroot at emetic doses (Felter 1922). Wild cherry leaves, and for a child a strong bark infusion. Water hemlock dug as ginseng (PH-10).

**Slow harms the Eclectics missed.** Boneset pyrrolizidines (Colegate et al. 2018). Sassafras safrole (FDA 1960). Possible black cohosh liver injury (Mahady et al. 2008). Sanguinarine leukoplakia (Eversole et al. 2000).

**Harm by substitution.** Black salve instead of excision leaves cancer in a third of lesions (Croaker et al. 2023). Echinacea in place of wound care for sepsis or snakebite.

**Interactions.** Berberine plants with ciclosporin, metformin and drugs cleared by CYP3A4, CYP2D6 and CYP2C9 (Dumitru et al. 2026). Slippery elm delaying any oral medicine.

**Who must never receive them.** Pregnancy and breastfeeding: cascara, black and blue cohosh, berberine plants, boneset, mayapple, sassafras. Children: wild cherry, lobelia, boneset, and cascara and echinacea under 12. Newborns: berberine. Liver disease: black cohosh, boneset. Asteraceae allergy: echinacea, yarrow, boneset.

**Overharvest.** Goldenseal, ginseng and slippery elm die when harvested.

## Red flags

- A skin lesion that bleeds, grows, ulcerates or changes colour: no salve, it needs excision.
- Vomiting, confusion, slow pulse or seizures after any home remedy: suspect the remedy, keep the plant and the pot (PH-10).
- Yellow eyes, dark urine or pain under the right ribs during black cohosh, boneset or berberine: stop at once.
- Gasping, dizziness or a flushed face after wild cherry: cyanide.
- Constipation with vomiting, a swollen belly or no wind: possible obstruction, no cascara.
- Rectal bleeding during haemorrhoid treatment.
- A cold with fever over 39 °C, stiff neck, breathlessness, or lasting beyond 10 days.
- Any wild root from wet ground called ginseng, parsnip or cohosh.

## The case against

**Against the Native record as evidence.** Moerman himself says his catalogue records use, not effect, and has argued that many remedies work through meaning (THRIVING library, TR-01). Marco Leonti showed that copying between texts inflates apparent independent use (THRIVING library, TR-01). Outsiders collected the records, often after epidemics and removals had broken transmission, so counts reflect ethnographers as much as nations. My tally rests on famous plants, which is survivor bias.

**Against the Eclectics.** Felter's own words show the school pushed lobelia emetics, podophyllin for babies and cascara in pregnancy. Their confidence in echinacea for sepsis rested on patients who recovered anyway, while those who died wrote no testimonials. The Flexner report of 1910 judged the sect's schools inadequate, and they closed within a generation [VERIFY].

**Against the modern verdicts.** Regulators and Cochrane reviewers reach different conclusions from the same echinacea and black cohosh trials, and the EMA's own committee recorded a dissent (EMA 2018). The positive echinacea meta-analysis may be industry-linked [VERIFY], while negative trials used different species, parts and doses. Paul Bergner argues that lobelia's reputation rests on one disputed case (Bergner, undated). The US Pharmacopeia reviewers judged the black cohosh liver reports only possible, and Rolf Teschke judged them mostly unlikely.

**Against the useful plants.** The resin trial had 37 patients and 22 finished. The Mahonia trials are small, some run by makers [VERIFY]. Witch hazel and slippery elm rest on tradition and mechanism alone.

## 10-line summary

1. North America's two records are Moerman's catalogue of Native use and the Eclectic dispensatories, and the Eclectics adopted every Native plant checked here.
2. A century of Eclectic practice refined doses and toxic signs, kept every harmful plant and missed the slow poisons.
3. Grade A: cranberry for recurrent cystitis and purified podophyllotoxin for genital warts.
4. Grade B: spruce resin for pressure ulcers, cascara for constipation, Mahonia for psoriasis, ginseng extract and echinacea juice for cold prevention.
5. Grade X: bloodroot salve, lobelia, mayapple root, sassafras, jewelweed after a rash, echinacea for children, black cohosh root for flushes.
6. Wild cherry's cough effect is cyanide: adults only, autumn bark, cold infusion, low dose.
7. Boneset carries liver-toxic pyrrolizidine alkaloids that Felter called harmless.
8. Goldenseal is scarce, unproven and should give way to Oregon grape or barberry.
9. The leading Native use was confirmed with benefit for about 1 in 10 of these plants and showed a real effect for about 1 in 4.
10. Grow witch hazel, slippery elm, cascara, Oregon grape, yarrow, echinacea, cranberry and conifers, and leave lobelia, bloodroot, sassafras and mayapple alone.

## Open questions

- Final ATSDR cyanide figures, and measured release from cold wild cherry infusions.
- Hydroxyanthracene content of household-aged cascara bark, to match Felter's grains to EMA's milligrams.
- Whether fir and pine resin match spruce in a wound trial.
- Boneset alkaloid content by region and chemotype.
- Slippery elm's actual US regulatory status.
- Strength and funding of the positive Mahonia creams.
- A random-sample screen of the North American medicinal flora matched to use.
- Which nations want their knowledge credited, by which names, and which records they hold restricted.

## Sources to read in full

1. Felter 1922 and *King's* 1898, the entries above, including Felter's goldenseal and lobelia entries.
2. The BRIT database records and the ethnographies behind them, especially Hamel and Chiltoskey 1975 and Herrick 1977.
3. The full Cochrane texts: Karsch-Völk et al. 2014, Leach and Moore 2012.
4. Sipponen et al. 2008 and Colegate et al. 2018.
5. Croaker et al. 2023 on black salve.
6. Moerman 1991, Vogel 1970, and Nelson, Shih and Balick 2007 on poisonous plants, none obtained.

## At the bedside after the Fall

A woman of 70 has a palm-sized pressure sore over her sacrum, red at the edges. Turn her every two hours, day and night, because no salve heals a sore still pressed. Wash with boiled water cooled to body warmth, spread resin salve thinly, cover with clean cloth, and look at every change. If redness spreads past a hand's width, she becomes feverish or confused, or the sore turns black and soft, this is beyond the salve.

A man of 40 has a dry cough a week after a cold, no fever, no breathlessness. Give cold slippery elm mucilage as often as he likes. If you have autumn cherry bark, a small cold infusion at night for up to three nights is the Eclectic choice. Never give it to the children, and label the jar.

A child of 6 has streaked blistering rash on both forearms the day after playing among vines. The time for washing has passed. Cool wet cloths and short nails, and it will run its course [VERIFY duration]. Jewelweed will not change it now.

A neighbour brings a jar of black paste that "draws out" skin cancer. Take it away. A third of cancers treated this way remain under the scar.

## Protocols

### Protocol 1. Resin salve from spruce, fir or pine

- ☐ Gather hardened resin from old wounds on living trees. Never cut fresh wounds. Clear amber or white resin only, no bark, insects or mould.
- ☐ For 100 g of salve: 10 g resin, 18 g beeswax, 72 g oil or lard (10 per cent resin from Yamileva and Multia 2025, 1 wax to 4 fat from THRIVING library, PH-01) [VERIFY trial strength].
- ☐ Melt resin with the fat in a water bath, never over open flame, 20 to 40 minutes, stirring until dissolved.
- ☐ Strain hot through cloth, stir in the wax until melted, pour into clean dry jars. Label plant, date, 10 per cent, external only.
- ☐ Test on the inner arm for 48 hours. Stop at itching, redness or blistering.
- ☐ On a wound: clean, thin layer, cover, change every 1 to 3 days. A wound larger at 2 weeks needs another approach.

### Protocol 2. Witch hazel decoction

- ☐ Weigh 5 to 10 g chopped dried bark or twigs.
- ☐ Add to 250 ml cold water, simmer 10 to 15 minutes, cover, cool, strain (EMA 2019 dose).
- ☐ Skin or haemorrhoids: soaked cloth for 10 to 20 minutes, up to 3 times a day. Fresh daily.
- ☐ Gargle: 2 to 3 g by the same method, gargle and spit, up to 3 times a day.
- ☐ Not under 12, or under 18 for haemorrhoids. Stop and seek help at rectal bleeding or no improvement in 1 week (2 for haemorrhoids).
- ☐ The sources differ: EMA gives external use, Felter 0.3 to 3.9 g by mouth. The book uses it externally.

**Protocol 3. Slippery elm cold mucilage and poultice**

- ☐ Inner bark from fallen, felled or planted trees, never girdled. Dry and shred.
- ☐ Mucilage: hang 1 to 3 g shredded bark in a cloth bag in 150 ml very cold water for 1 to 2 hours, squeeze, remove (Felter method, ratio by transfer from marshmallow, THRIVING library, PH-01) [VERIFY ratio]. It should be thick and ropy.
- ☐ Sip freely for throat or cough, a cupful up to 4 times daily for the gut.
- ☐ Any other medicine at least 1 hour apart.
- ☐ Poultice: powdered bark and warm boiled water to a paste, on cloth, on an inflamed unbroken surface, changed every 2 to 4 hours. Never on open wounds (Felter 1922).
- ☐ Make fresh daily. Discard if sour.

**Protocol 4. Wild cherry cold infusion, adults only**

- ☐ Bark only, from *P. serotina* or chokecherry, stripped in autumn, inner bark dried in shade, labelled. Never leaves or seeds.
- ☐ Weigh 1 to 2 g chopped dried bark a dose, the lower half of Felter's 0.3 to 3.9 g.
- ☐ Steep in 50 ml cold water, covered, 6 to 12 hours. Strain. Do not boil (Felter 1922, Felter and Lloyd 1898).
- ☐ The sources differ: *King's* official 40 g a litre gives 1.2 to 3.6 g bark a dose, its other entry about 60 g a litre. This dose stays below both [VERIFY].
- ☐ Up to 3 doses a day, no more than 3 days. Never for children, pregnancy or breastfeeding.
- ☐ Never store as a sweet syrup within a child's reach. Label "adult cough, poison to children".
- ☐ Stop at headache, dizziness, breathlessness or flushing.

**Protocol 5. Cascara tea of aged bark**

- ☐ Strip and dry *Frangula purshiana* bark, write the date on the bag, and store at least a year. Younger bark is not used.
- ☐ First dose 0.5 g, never more than 1 g at first, within Felter's 0.3 to 1.9 g [VERIFY against EMA's 10 to 30 mg].
- ☐ Pour 150 ml boiling water over it, steep 10 minutes, strain, drink at night (EMA 2020).
- ☐ Smallest dose giving a soft stool, 2 or 3 times in a week, never beyond a week.
- ☐ Never under 12, in pregnancy, breastfeeding, abdominal pain of unknown cause, vomiting or a swollen belly.
- ☐ The sources differ: Felter allowed pregnancy, EMA forbids it. Follow EMA.

**Protocol 6. *Echinacea purpurea* pressed juice**

- ☐ Harvest flowering aerial parts on the day of use. Chop and press, or pound and squeeze through cloth. Use the same day.
- ☐ Over 12 only. 1.5 to 4.5 ml a dose, 6 to 9 ml a day, from the first sign of a cold, at most 10 days (EMA 2015).
- ☐ Never with Asteraceae allergy, autoimmune disease or immunosuppressive drugs.
- ☐ Not for children's colds: no benefit and more rashes (Taylor et al. 2003).
- ☐ The sources differ: Felter used *E. angustifolia* root tincture at 1 to 5 drops for sepsis, not colds. Do not mix the two.

## Numbers to carry

- North American medicinal flora: 2,428 of 20,669 species, 11.7 per cent.
- Krochmal's medicinal list active 26.7 against 10.4 per cent at random.
- Leading Native use confirmed with benefit: about 1 in 10 of these plants. Real effect: about 1 in 4.
- Echinacea Cochrane: 24 trials, 4,631 people, prevention reduction 10 to 20 per cent at best. Children: rash 7.1 against 2.7 per cent.

- Black cohosh Cochrane: 16 trials, 2,027 women, flushes no different from placebo.
- Black salve: cancer persisted in 34.2 per cent of lesions, 18 per cent were benign.
- Wild cherry bark: 0.5 to 3.4 mg hydrocyanic acid a gram. Lethal near 0.7 to 1.5 mg per kg.
- Boneset: pyrrolizidines 0.0002 to 0.07 per cent in 49 samples.
- Resin salve: 92 against 44 per cent healed.
- Podophyllotoxin: 41 of 60 cured against 0 of 20. Crude resin under 10 cm2, 0.5 ml, off within 1 to 4 hours.
- Witch hazel: 5 to 10 g in 250 ml compress, 2 to 3 g gargle, 3 times daily.
- Cascara: 10 to 30 mg hydroxyanthracenes at night, 1 week, bark aged 1 year.
- Echinacea juice: 6 to 9 ml a day, 10 days.
- Goldenseal: CITES Appendix II since 18 September 1997.
- One grain 64.8 mg, one fluid drachm 3.7 ml, one fluid ounce 29.6 ml.

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