

Modern Phytotherapist

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Phytotherapy for the Treatment of Pain

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Introduction

The phenomenon of pain occurs as a result of the activation of at least two major neurological networks in the mindbody. Pain is an extremely complex event given the intricate connections within and between these neurological networks and between the pain-sensing systems and other psychoneuroendocrine networks. A number of botanical medicines have proven effective for relieving different forms of pain empirically and in clinical trials. The mechanisms of action of various anodyne (analgesic) herbs are not always understood, though some have been well delineated.

Basic Neurobiology of Pain

The two pain networks are known as the slow and fast systems (summarised in table 1).¹ The more ancient slow pain system begins with unmyelinated type C fibres in the skin or other tissues. The C fibres synapse in the spinal cord, often first with small interneurons then with second order neurons that carry the incoming pain signal to various brainstem nuclei. The signal is then relayed, usually by multiple short neurons, to the thalamus and only indirectly to the cerebral cortex.

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The recently evolved fast pain system begins with thinly myelinated A-delta fibres. These synapse in the spinal cord and the second order neurons ascend through the spinal cord to the thalamus. Third order neurons transfer the information to the cerebral cortex.

Visceral pain (i.e. pain from any of the large interior organs) is sensed only by the slow-type pain system, while pain from the skin can be sensed by fast- and slow-type pain systems. Both slow and fast pain can be sensed without the cerebral cortex, though the cortex clearly plays a role in integrating and modulating various pain signals.

Pain is often referred from one area to another. This is due to spinal neurons receiving input from the viscera and deep musculoskeletal structures and also receiving input from the skin. In addition, tissues with the same embryological origin may input signals to the same places in the spinal cord and inputs from one region often synapse at multiple levels in the spinal cord. Pain is also often poorly localised, particularly slow pain, possibly because of the multiple synapses in both pain networks' neuron chains and the effects of simultaneous inputs from tactile sensation modulating pain signals.

C fibres utilise substance P as their major neurotransmitter. Substance P is released from the distal terminus of a C fibre when it is activated. This in turn causes mast cells to release histamine, which triggers a signal to travel from the peripheral to the central nervous system. Substance P builds up and breaks down slowly. This phenomenon, combined with the unmyelinated nature of C fibres, explains the slowness of the slow pain network and why slow pain can linger even after the initial trigger is removed.

A-delta fibres utilise aspartate, glutamate, substance P, and calcitonin gene-related product (CGRP) as their primary neurotransmitters. The myelination of A-delta fibres combined with faster neurotransmitters accounts

for the speed of the fast pain network.

The mindbody has an endogenous analgesic system consisting of neurons in the spinal column, brain stem, and periaqueductal grey regions. These neurons produce endogenous opioid neurotransmitters such as enkephalins, endorphins and dynorphin which act on four subtypes of opioid receptors with a variety of effects, including the reduction of pain sensation. Serotonergic neurons in the brainstem are also believed to modulate endogenous opioid secretion. Finally, endogenous cannabinoids in the cerebral cortex and possibly other sites also modulate pain sensation and responses.

Botanical Analgesics

Salicylate-containing Herbs

Among the best researched and longest used botanical analgesics are plants containing salicylate glycosides, particularly *Salix* spp. (willow) bark, the bark of *Populus tremuloides* (quaking aspen) and other *Populus* species and *Betula* spp. (birch) bark. The example of willow will be discussed primarily here, as it has been best studied. The degree to which this information applies to other salicylate-rich herbs is unknown, though all have been used effectively with some patients. Willow and aspen are generally considered more specific to the musculoskeletal system while birch is more specific to the genitourinary tract. Though *Salix alba* is often considered the standard willow bark for clinical use, it actually contains relatively low salicylate levels. Much higher levels are present in *S. daphnoides*, *S. purpurea* and other species.²

Willow bark extracts standardised to provide 120–240 mg per day of salicin (often referred to as salicoside) have been the subject of several randomised clinical trials investigating their efficacy in patients with lumbalgia and various arthritides (arthritic conditions). A four-week, double-blind trial involving 210 patients with idiopathic chronic low back pain compared two doses of salicin-standardised willow bark extract with placebo.³ There was a dose-dependent superiority of

Pain Type	Evolutionary History	Stimuli	Onset after Stimulus	Characteristics of the Pain	Peripheral Nerve Fibres
Fast	Recent	Mechanical, thermal	100 microseconds	Sharp, pricking, electric, acute	A-delta
Slow	Ancient	Mechanical, thermal, chemical	Seconds to minutes	Burning, throbbing, aching, nausea, chronic itch (partially)	C

Table 1: Major human neurologic networks for sensing pain.

willow bark over placebo in relieving low back pain. The higher dose showed moderately greater effectiveness compared to the lower dose, particularly as on average the higher dose relieved pain a full week earlier than the lower dose. The analgesic drug tramadol was used as a rescue pain-reliever significantly more often in the placebo group than in either willow bark group. There was only one case of allergy in this trial that could be attributed to willow bark. A follow-up study recently found that willow standardised extract (providing 120 mg per day of salicin) was cheaper than non-steroidal anti-inflammatory drug (NSAID) therapy with similar efficacy. Willow bark standardised extract (equivalent to 240 mg per day of salicin) was approximately as expensive as the drugs.⁴ The authors noted that willow bark probably contains active constituents other than salicin and it may act by non-salicylate-mediated mechanisms. Exaggerated focus on any one constituent including salicin may ultimately crowd other important molecules out of willow bark extracts, actually reducing efficacy.

A product combining 100 mg willow bark, 40 mg *Guaiacum officinalis* (Guaiacum) resin, 17 mg of a 7:1 extract of poplar bark (*Populus* spp.), 25 mg of a 4:1 extract of *Smilax* spp. (sarsaparilla) root/rhizome and 35 mg *Cimicifuga racemosa* (black cohosh) rhizome per tablet has been investigated in a two month, double-blind, placebo-controlled trial for patients with osteoarthritis or rheumatoid arthritis.⁵ The dose was not clearly defined but two tablets were taken at a time. The herbal formula was superior to placebo at relieving arthritis pain, though the clinical significance of the change was marginal. Concomitant NSAID consumption did not change in either group during the trial. It is possible that an insufficient dose of the product was used.

The author of a small double-blind, placebo-controlled trial involving patients with osteoarthritis of the knee and/or hip joint concluded that the analgesic effect of willow bark extract could not be attributed to the salicin derivatives alone.⁶

As other constituents of willow bark (such as flavonoids and other phenolic compounds) must contribute to the overall activity exaggerated focus on any one constituent including salicin may lead to reduced efficacy.

Herbs containing salicylates may work primarily by interfering with production of bradykinin and cytokines during tissue damage and inflammation.⁷ These mediators are particularly likely to activate the slow pain network (fast type pain is not generally

induced by tissue destruction). To some extent salicylate-containing herbs work by treating the cause of the pain and by interfering with pain transmission. These herbs are generally not as effective for psychogenic pain or pain not related to inflammation or tissue destruction. Salicylates may also have activity in the central nervous system to reduce pain sensation.

Although the synthetic salicylate derivative acetylsalicylic acid (aspirin) clearly interferes with platelet aggregation and hence blood fluidity, natural salicylates appear not to have this effect to any clinically significant degree.⁸ Whilst there is little concern in combining salicylate-containing botanicals with anticoagulants or synthetic salicylates, patients on this therapy warrant supervision. Salicylate-containing herbs cannot be substituted for aspirin for prevention of stroke or myocardial infarction. Salicylate sensitivity is an absolute contraindication to use of salicylate-containing botanicals.

Anti-inflammatory Analgesics

Other anti-inflammatory botanicals may also reduce inflammation-associated pain. They may also have direct analgesic properties, though this has been poorly researched. *Harpagophytum procumbens* (devil's claw) tuber is the best researched of this group of botanicals. This native southern African plant contains, among many other compounds, a variety of bitter, anti-inflammatory and analgesic iridoid glycosides.⁹ Numerous uncontrolled and double-blind trials have shown devil's claw extracts to be effective for reducing the pain of osteoarthritis, lower back pain and rheumatism.¹⁰⁻¹³ The exact mechanism of action is not fully understood.¹⁴ There is evidence that stomach acid degrades the activity of the devil's claw constituents, which might explain why some studies show devil's claw lacks efficacy.¹⁵ Devil's claw preparations should be administered between meals when gastric activity is at its lowest. However, more recent experiments with simulated stomach conditions found that harpagoside was stable.¹⁶

Devil's claw is particularly handy when the patient suffers dyspepsia, hypochlorhydria or other syndromes of impaired digestive function because of the herb's bitterness. However, these effects also make it contraindicated in acute diarrhoea, active peptic ulcers and hyperchlorhydria. Usual doses of fluid extracts/tincture (1:2–1:5) are 4–5 mL three times daily, though for more acute pain higher doses (up to 10 mL 4–5 times daily) may be required for 1–2 days.

Tanacetum parthenium (feverfew) leaf is another

established anti-inflammatory botanical. The major active compounds are believed to be sesquiterpene lactones (parthenolides) which have shown effects including inhibition of platelet aggregation, inhibition of phospholipase A₂, spasmolytic activity and other effects *in vitro* and in animals.¹⁷ Several double-blind trials have proven that powdered crude or freeze-dried feverfew can prevent and/or reduce the severity of migraine headaches.¹⁸ A trial using feverfew extracted in 90% ethanol and granulated was not successful. Further trials are warranted but this form of preparation may not be efficacious.¹⁹ If fluid extracts or tinctures are used, an ethanol content lower than 90% is recommended.

The one available double-blind trial on use of feverfew in rheumatoid arthritis patients was negative, casting uncertainty on the use of feverfew as an analgesic and anti-inflammatory in conditions other than migraine.²⁰ Nevertheless, feverfew is frequently used for other conditions traditionally, and higher doses may be necessary for longer periods of time for best effects. Typical doses of capsules of crude herb are 25–100 mg daily for prevention and up to double this amount acutely. Typical doses of 1:2–1:3 are 3–5 mL three times daily for prevention and up to 10–12 mL five times daily acutely. Side effects may occur in patients allergic to feverfew or members of the Asteraceae/Compositae (daisy) family.

Numerous other anti-inflammatory herbs might be considered in patients with inflammation-related pain. *Zingiber officinale* (ginger) rhizome and its relative *Curcuma longa* (turmeric) tuber, and *Boswellia serrata* (Boswellia) gum resin are some systemic anti-inflammatories. Topically, creams or other preparations of *Arnica montana* (Arnica) flower might give some relief.

Ginger is a well-established anti-inflammatory with antinausea, digestive stimulating, anticancer and antimicrobial properties. A double-blind trial has established the efficacy of ginger, combined with *Alpinia galanga* (galangal) root, in relieving symptoms in patients with knee osteoarthritis.²¹ Case studies suggest it may also help alleviate pain and inflammation in patients with rheumatoid arthritis, though controlled clinical trials are needed to confirm these observations.²² Ginger, turmeric, and galangal are all members of the Zingiberaceae family. Turmeric contains anti-inflammatory and antioxidant compounds known as curcuminoids including curcumin itself. Curcumin has been shown to reduce postoperative inflammation as effectively as phenylbutazone and more effectively than placebo in one double-blind trial, though pain was equally relieved by all three treatments (curcumin,

phenylbutazone and placebo).²³ Boswellia is a fragrant Middle Eastern herb documented in initial clinical trials to alleviate inflammation in patients with conditions such as ulcerative colitis and chronic non-ulcerative colitis.^{24,25} Its effects on pain in such settings has not been specifically investigated.

One trial has looked at a combination formula containing Boswellia, ginger, turmeric and *Withania somnifera* (ashwagandha), an immunomodulator.²⁶ The extract used was poorly described; the daily dose was said to be 444 mg. This sixteen-week, double-blind trial randomised 165 patients in India with rheumatoid arthritis to the herbal formula or placebo. There was no difference between the herb and placebo groups in terms of pain, though joint swelling was modestly decreased in the herb group. Underdosing, low-quality herbal extracts, and failure to concomitantly remove disease-provoking influences, such as food allergens, may explain the poor outcomes. A review of clinical trials conducted in Germany up to 1996, of which two were double-blind, suggested that Boswellia was helpful for rheumatoid arthritis patients, although since that time a negative double-blind trial has been published.^{27,28} More research is definitely needed to determine the best approach and dose using these herbs in patients with painful, inflammatory conditions.

Topical treatment of painful, inflamed joints, muscles, or other structures may be beneficial using some herbal extracts. Unfortunately, there are no published clinical trials demonstrating an anti-inflammatory or analgesic effect for topical Arnica, despite widespread clinical use.²⁹ The European Scientific Cooperative on Phytotherapy (ESCO) suggests topical Arnica may be helpful in treating sprains, myalgia, and rheumatic pain and inflammation.³⁰ While a few drops of tincture (1:10) can be applied topically, it is most typical to use a cream or gel at least three times per day.

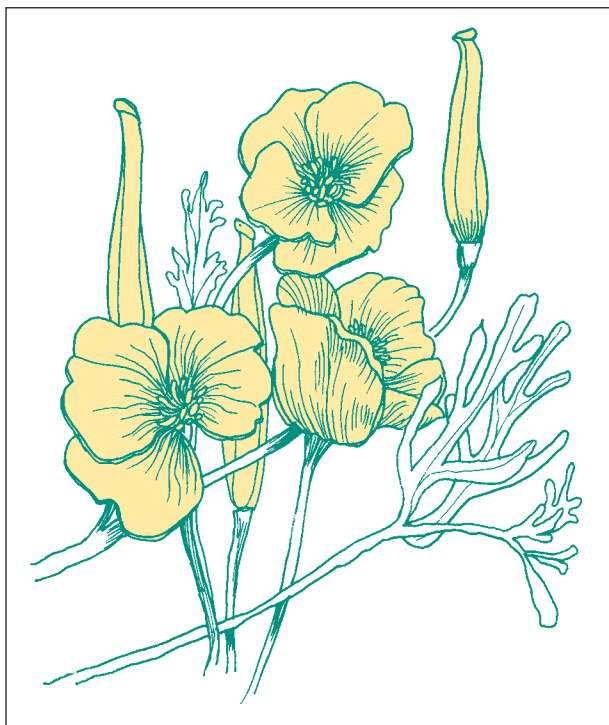
Hypnotic Analgesics

Most of the herbal medicines used for improving sleep quality and duration also have analgesic activity. They are often most useful when pain is spasmodic in nature, although generalised reduction of even nonspasmodic pain is often observed. The mechanism of action of these herbs has received minimal research attention, so most of this information is based on centuries of clinical experience.

The root of valerian (*Valeriana officinalis* and other species) has been investigated the most for its hypnotic activity. Valerian is not sedative in most humans, meaning that it will not produce sleepiness unless taken when one is trying to fall asleep. In fact, most studies

show that valerian administration actually enhances alertness when taken on a regular basis, most likely due to an improvement in sleep quality and a lack of sedative activity.³¹ These results are in stark contrast with benzodiazepines, which blunt daytime wakefulness and damage sleep microarchitecture and quality.

Valerian has been recommended for relieving pain in general, nervous headache, and spasmodic pains by the Eclectics.³² Animal studies have largely failed to show a centrally-mediated, general analgesic effect for valerian extracts.³³ Valerian constituents may act primarily on GABAergic neurons, possibly including the interneurons that help regulate transmission of pain signals in the central nervous system, though the evidence is certainly not definitive on the mechanisms of action.³⁴ Considering the existing research it is difficult to reconcile the frequently held opinion of clinicians that valerian has analgesic activity. Even if valerian only helps people indirectly compensate for acute or chronic pain by improving their sleep quality, it could still be of value. Its primary indications are improving sleep, especially that disturbed by pain, and relief of smooth muscle spasm. Typical doses of 1:2–1:3 are 5–10 mL at bedtime and 3–5 mL three times daily for ongoing pain treatment. Other than the occasional individual who has an opposite reaction to valerian and becomes overstimulated, valerian is extremely safe.



CALIFORNIA POPPY

Other botanicals that may have similar benefits to valerian are *Passiflora incarnata* (passionflower) aerial parts, *Scutellaria lateriflora* (skullcap) herb, *Eschscholzia californica* (California poppy) aerial parts, *Lactuca virosa* (wild lettuce) leaf, and *Piscidia piscipula* (Jamaica dogwood) root bark. None of these herbs has been the subject of clinical trials for relief of pain of any type in humans to date, though at least passionflower and California poppy have documented hypnotic effects in preliminary clinical trials.³⁵⁻³⁷ Passionflower has been suggested as a treatment specifically for neuralgia.³⁸ Skullcap was regarded by Felter as primarily allowing restful sleep to occur and thereby only indirectly relieving pain.³⁹ California poppy is a well-established traditional, very safe analgesic in American herbalism.⁴⁰ The latex of wild lettuce, known as lactucarium, was formerly utilised by the Eclectics as a weak substitute for opium.⁴¹ Jamaica dogwood is spoken of as a potent hypnotic, anodyne and spasmolytic in the Eclectic literature, effects borne out in modern practice.⁴² It is surprising the lack of clinical research on these potentially useful herbs.

Central-acting Analgesics

Some of the most powerful botanical analgesics have surprisingly received almost no attention in modern research at all. All are believed to act in the central nervous system, though peripheral activity cannot be excluded based on existing knowledge. Clinically, these herbs, when applied in safe doses, can be extremely effective. Four that will be discussed here are *Bryonia alba* (white bryony) root, *Pulsatilla vulgaris* (Pulsatilla) aerial parts, *Gelsemium sempervirens* (Gelsemium, yellow jasmine) root, and *Corydalis yanhusuo* (yanhusuo, Corydalis) tuber. (A number of species of *Corydalis* including *C. ambigua*, *C. yanhusuo* and *C. turtchaninovii* have been used as the traditional Chinese medicine yanhusuo.) For greatest safety, heavy machinery should not be operated while taking herbs in this category that have sedative effects (Gelsemium and yanhusuo primarily and possibly fresh plant *Pulsatilla*). Dried plant *Pulsatilla* is milder than fresh plant tinctures, but should be taken within the recommended dosage range.

White bryony root has been used by both herbalists and homoeopaths. It is usually recommended for pain and inflammation in serous membranes, particularly pleurisy, made worse by even small movements. White bryony is probably interchangeable with *Bryonia cretica* ssp. *dioica* (red bryony). Cucurbitacins from both plants have been investigated as immunomodulating and antiatherosclerotic agents, but have not been looked at as analgesics. Early signs of toxicity include



PULSATILLA (ALSO KNOWN AS PASQUE FLOWER)

gastrointestinal distress. The usual dose of tincture (1:10) is one drop diluted in approximately 120 mL water three or more times daily. White bryony is contraindicated in children, during pregnancy or lactation, and in patients with hepatic or renal failure.

Pulsatilla or pasque flower herb contains potent glycosides such as ranunculin. The aglycone of this molecule is protoanemonin which spontaneously dimerises to form the milder compound anemonin. Drying appears to promote dimerisation. Ethanol may also promote dimerisation and reduction of toxicity. The fresh herb is recommended for use by the Eclectics, but it is likely more toxic than the dried plant. Felten recommended Pulsatilla for deep eye pain, pain in general with debility, headache, neuralgia, and toothache.⁴³ It is considered particularly indicated for pain emanating from reproductive organs. British herbalists favoured the use of the dried plant and recommended it particularly for the treatment of painful conditions of the male or female reproductive system. Other indications included tension headache.⁴⁴ Modern clinical trials have not investigated its efficacy. Even excessive doses of dried Pulsatilla preparations can cause serious side effects including severe gastrointestinal irritation. A typical dose of fresh plant tincture (1:10) is 1–5 drops t.i.d. or as needed for acute pain. A typical dose of dried plant tincture (1:10) is

0.5–3 mL t.i.d. (1.5–9 mL per day). Pulsatilla is contraindicated in pregnancy, lactation and for use in children.

Gelsemium root shares some features with Pulsatilla, though it has its unique features as well. Like Pulsatilla, it has been recommended for pain in the genitourinary tract, particularly when related to "nervous tension".⁴⁵ Gelsemium is more sedating than Pulsatilla and has been used successfully by many practitioners for pain-induced insomnia, insomnia not relieved by milder therapies and severe anxiety. Typical doses of tincture (1:10) are 1–5 drops three times daily or as needed. Overdose may provoke neuromuscular toxicity and death can occur in extreme cases due to paralysis of the diaphragm. Gelsemium is contraindicated in pregnancy, lactation and children.

Yanhusuo (Corydalis) is a Chinese herb traditionally utilised to relieve pain including dysmenorrhoea, angina and epigastric pain. It may also help for mild cancer pain. It has a relaxing and sedating effect. The main active constituents are alkaloids including tetrahydropalmatine. Yanhusuo extracts have shown analgesic activity approximately 1% as strong as opium in animal studies.⁴⁶ Animal research suggests yanhusuo acts on dopamine receptors in the central nervous system, and possibly via serotonergic and noradrenergic neurons.⁴⁷ There are many other species of Corydalis, and not all share the same properties, so substitutions should be made carefully if at all. The usual dose of tincture (1:3–1:5) is 0.25–1 mL three times daily. In traditional Chinese medicine, 4.5–12 g of the crude herb is recommended daily, generally in divided doses as a decoction. Yanhusuo is contraindicated in pregnancy due to possible abortifacient properties. Adverse effects are uncommon at proper doses, though headache or fatigue may occur.

Topical Analgesic

A botanical medicine that has proven to have an utterly unique mechanism of pain relief is the resinous compound capsaicin extracted from the fruit of *Capsicum minimum* and other species (cayenne). Capsaicin gives cayenne its spiciness. Capsaicin is a powerful and basically safe tool for relieving a variety of forms of pain when applied topically. However, since it does not treat the cause of pain, it must be seen as a supportive measure at best, and other efforts instituted whenever possible to eliminate the cause of the pain.

Capsaicin has a unique mechanism of action. It binds to vanilloid receptors and strongly promotes release of substance P, neurokinin, somatostatin, and calcitonin

from peripheral nerve fibres, particularly C fibres in the slow pain network.⁴⁸ This initially provokes worsening of pain and itching. However, with a few repeated applications, the C fibres are depleted of these neurotransmitters, and are no longer able to transmit pain or itch signals. With continued use, this effect can be sustained indefinitely.

Conditions in which topical capsaicin has proven effective in double-blind trials include various neuralgias,⁴⁹ diabetic neuropathy,⁵⁰ dialysis-induced pruritus,⁵¹ psoriatic pruritus,⁵² fibromyalgia,⁵³ osteoarthritis,⁵⁴ stump pain,⁵⁵ postmastectomy pain⁵⁶ and postherpetic neuralgia.⁵⁷ Another interesting though initially very uncomfortable use is intranasal application of capsaicin for relieving cluster or migraine headaches.⁵⁸

Various commercial capsaicin creams are available, generally in 0.025% and 0.075% strengths. Typically one to three applications are needed daily although best results come with multiple use in a day. The milder form is tried first, and the stronger resorted to only if the milder is not sufficient. It is imperative that patients

either wear disposable gloves or wash very thoroughly with hot water and soap after applying capsaicin. If capsaicin is inadvertently transferred to mucous membranes, the result is intense burning pain and discharge. There are no other known adverse effects of capsaicin use.

Conclusion

Botanical medicine offers numerous possible remedies for a multitude of pain syndromes, some of which are reviewed here. The mechanism of action is understood in some but not all cases. Salicylate-containing and anti-inflammatory botanicals are most suitable for pain due to inflammation and are quite safe. Hypnotic analgesics have more general analgesic properties and are ideal when pain contributes to insomnia. Several other centrally-acting herbs have stronger anodyne properties, though they must be used in low doses to avoid adverse effects. Finally, topically capsaicin offers a useful way to relieve neuropathic pain, pruritus, and other pain syndromes. These herbs alone and combined with acupuncture and other treatment modalities can bring relief to numerous patients suffering pain.

Botanical Name and Part Used	Indications	Typical Dose	Cautions
Salicylate-containing Herbs			
<i>Salix</i> spp. (willow) bark	Pain due to inflammation or tissue destruction (arthritis, myalgia, headache, postsurgical pain)	SE: providing 120–240 mg per day of salicin Fluid extract (1:2): 3–5 mL, 3–5 times daily Fluid extract (1:1): 2–4 mL, 3–4 times daily	May cause GI upset. CI: salicylate allergy
Anti-inflammatory Analgesics			
<i>Harpagophytum procumbens</i> (devil's claw) tuber	Pain due to inflammation (arthritis, myalgia, headache)	SE: providing 50–100 mg per day harpagoside Liquid extract/Tincture (1:2–1:5): 4–5 mL t.i.d. Liquid extract (1:1): 3–4 mL t.i.d.	May be superior in enteric-coated delivery forms. Avoid in acute diarrhoea, acute peptic ulcers, and hyperchlorhydria.
<i>Tanacetum parthenium</i> (feverfew) leaf	Migraine and other headaches, possibly arthritis and other inflammatory syndromes	25–100 mg powdered herb daily in capsules/tablets Liquid extract/tincture (1:2–1:3, < 40% ethanol content): 3–5 mL t.i.d.	None known.

Botanical Name and Part Used	Indications	Typical Dose	Cautions
Anti-inflammatory Herbs			
<i>Zingiber officinale</i> (ginger) rhizome	Arthritides, inflammatory conditions such as dysmenorrhoea	Dried or powdered rhizome, tablets or capsules: 0.5 g, 2–4 times daily Liquid extract (1:2): 0.2–0.6 mL t.i.d. Tincture (1:5): 0.6–1.6 mL t.i.d.	Peptic ulceration, other gastric diseases. Caution: doses of < 4 g/day in patients who are taking blood-thinning drugs (e.g. warfarin, aspirin) or who have increased risk of haemorrhage. CI: doses of > 4 g/day in patients taking blood-thinning drugs
<i>Curcuma longa</i> (turmeric) tuber	Arthritides and other inflammatory conditions including inflammatory skin conditions	Powdered tuber: 1–3 g t.i.d. Liquid extract (1:2, > 45% ethanol content): 1–3 mL, five times daily	High doses (> 15 g/day) should not be given to patients taking antiplatelet or anticoagulant drugs.
<i>Boswellia serrata</i> (Boswellia) gum resin	Arthritides, other inflammatory conditions (inflammatory bowel disease, colitis, psoriasis)	Resin: 0.8–1.6 g t.i.d.	None known.
<i>Arnica montana</i> (Arnica) flower	Rheumatic pain and inflammation, bruising, sprains, swellings, myalgia	Dilute a 1:5 tincture by 5 times with water and apply 2–3 times daily. Ointment or cream containing 10–25% tincture: apply 2–3 times daily	Stop application on first sign of dermatitis. Avoid use on those with Arnica or other Compositae/ Asteraceae allergy. CI: Not to be taken internally under any circumstances. Do not apply to broken skin (i.e. open wounds) or near the eyes or mouth.
Hypnotic Analgesics			
<i>Valeriana officinalis</i> (valerian) root	Spasmodic pain, insomnia due to pain	Liquid extract/tincture (1:2–1:3): 5–10 mL h.s. OR 3–5 mL t.i.d.	None known, though occasionally individuals may become agitated.
<i>Passiflora incarnata</i> (passionflower) aerial parts	Neuralgia, insomnia, restlessness, anxiety	Liquid extract (1:2): 1–2 mL t.i.d. Tincture (1:8): 0.5–2 mL t.i.d. up to 2–4 mL, four times daily	None known.

Botanical Name and Part Used	Indications	Typical Dose	Cautions
<i>Scutellaria lateriflora</i> (skullcap) herb	Insomnia, restlessness, headache, neuralgia	Dried herb: 1–2 g t.i.d. Liquid extract (1:2): 0.6–1.5 mL t.i.d. Tincture (1:5): 1–2 mL t.i.d.	None known.
<i>Eschscholzia californica</i> (California poppy) aerial parts	Pain, insomnia, anxiety	Liquid extract (1:2): 1–2 mL t.i.d.	None known.
<i>Lactuca virosa</i> (wild lettuce) leaf	Rheumatic pains, insomnia and restlessness	Dried leaf: 0.5–4 g t.i.d. Liquid extract (1:1): 0.5–4 mL t.i.d.	None known.
<i>Piscidia piscipula</i> , <i>P. erythrina</i> (Jamaica dogwood) root bark	Painful conditions, neuralgia, sciatica, dysmenorrhoea, muscular spasm, rheumatism	Dried root bark: 2–4 g t.i.d. Liquid extract (1:2): 1–2 mL t.i.d. Tincture (1:5): 5–15 mL t.i.d.	May cause nausea, vomiting and headache in some patients when prescribed within the therapeutic dosage range. CI: pregnancy, bradycardia, cardiac insufficiency
Central-acting Analgesics			
<i>Bryonia alba</i> (white bryony) root	Pain (particularly pleurisy) worse from motion	Tincture (1:10): 1 drop in approximately 120 mL water t.i.d.	CI: children, pregnancy, lactation, hepatic or renal disease SE: cardiotoxicity
<i>Pulsatilla vulgaris</i> (Pulsatilla) aerial parts: fresh plant tincture	Reproductive tract pain, toothache, neuralgia, eye pain	Tincture (1:10): 1–5 drops t.i.d.	CI: pregnancy, lactation, children* SE: cardiac suppression
<i>Pulsatilla vulgaris</i> (Pulsatilla) aerial parts: dried plant tincture	Reproductive tract pain, toothache, insomnia	Liquid extract (1:2): 0.1–0.5 mL t.i.d. Tincture (1:10): 0.5–3 mL t.i.d.	CI: pregnancy, lactation
<i>Gelsemium sempervirens</i> (Gelsemium) root	Genitourinary tract pain, pain-induced insomnia	Tincture (1:10): 1–5 drops t.i.d.	CI: pregnancy, lactation, children* SE: neuromuscular toxicity
<i>Corydalis ambigua</i> , <i>C. yanhusuo</i> , <i>C. turtschaninovii</i> (Corydalis) tuber	Dysmenorrhoea, angina, cancer pain	Tincture (1:4): 0.25–1 mL t.i.d.	CI: pregnancy* SE: fatigue, headache
Topical Analgesic			
Capsaicin	Neuropathies, chronic pruritus, headache (intranasal)	0.025–0.075% creams: 1–3 applications daily	SE: transient initially worsening of symptoms, burning if applied to mucous membranes

Table 2: Summary of botanical analgesics.

Abbreviations: CI = contraindicated in, GI = gastrointestinal, h.s. = at bedtime, SE = standardised extract, t.i.d. = three times daily

* **Note:** Operation of machinery is not recommended while taking this herb, though the ability to drive is not likely to be impaired.

CASE STUDY

A 23-year-old sexually active man presented with acute intermittent dysuria and pelvic pain. He had one stable female sexual partner and they used condoms. In the past week, he had developed the symptoms. He was unsure of any differences in sexual activity, though he was under intense academic pressure. There was burning in the urethra on occasion, but the main sensation was of pain deep in the pelvis and radiating into the testes causing low-grade discomfort. Examination revealed only slight meatal inflammation and mild tenderness on palpation of the penis and scrotal contents. Rectal examination revealed moderate prostatic tenderness with no bogginess or nodules. A urethral culture ruled out chlamydia and gonorrhoea, and there was an absence of white blood cells. Four-glass urinalysis was negative for urinary tract or prostate infection. The tentative diagnosis was noninfectious prostatitis, seminal vesiculitis or epididymitis.

Treatment Regime

The patient was advised to discontinue sexual intercourse until symptoms resolved. It was suggested he drink plenty of water, eat a diet free of animal products but high in fruits and vegetables, and to avoid sitting on any hard surfaces, particularly bicycle seats. Daily alternating hot/cold sitz baths were recommended. He was also given capsules containing *Echinacea purpurea* aerial parts, *Hydrastis canadensis* (golden seal) root, zinc, vitamin A and vitamin C for immunomodulation.

Herbal Treatment

The primary concern was to reduce the patient's discomfort and help relieve the apparent immunological overreaction producing the problem. Though all laboratory evidence suggested the absence of an inflammatory component, some anti-inflammatories were included in his formula in case there was a low-grade problem or inflammation in tissues not accessed by the tests performed.

Pelvic Pain Formula (for 4 weeks)

Saw palmetto (<i>Serenoa repens</i>)	40 mL
Willow bark (<i>Salix alba</i>)	30 mL
Licorice (<i>Glycyrrhiza glabra</i>)	30 mL
Skullcap (<i>Scutellaria lateriflora</i>)	20 mL
	120 mL

Dose: 5 mL t.i.d.

Saw palmetto was chosen as a prostate tonic and mild anti-inflammatory. Willow bark was chosen for its anti-inflammatory and analgesic properties. (*Betula lenta* (birch) bark is a more specific salicylate-containing herb for the genitourinary tract but a source was not available at the time the formula was prescribed). Licorice was included as a systemic anti-inflammatory and immunomodulator and skullcap was used for its anxiolytic and hypnotic analgesic effects.

He was also given a separate bottle of *Pulsatilla vulgaris* (*Pulsatilla*) aerial parts, fresh plant tincture (1:10) and instructed to take 1–3 drops as needed for acute pain.

Second Consultation (3 weeks later)

The patient returned a week earlier than anticipated. Though he continued to have pain, its severity was significantly lessened. The *Pulsatilla* worked very well for him acutely, particularly when he had pain radiating into his testes. Over the next several weeks he reported in by telephone, and within 12 weeks he was essentially back to normal, though he required the *Pulsatilla* approximately twice a week.

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