E.3 Complementing Treatment of Inflammations

Some of the conditions for which people most commonly seek medical treatment are acute and chronic inflammation and its accompanying pain. Prescription and over-the-counter (OTC) drugs are a familiar means by which people attempt to control the pain. Long-term use of corticosteroids and non-steroidal anti-inflammatory drugs (NSAIDs) have by themselves proven dangerous and often inadequate. In addition, local steroid applications, injections, or topical analgesics in many cases are tried, and in rheumatoid arthritis additional disease-modifying anti-rheumatic agents like methotrexate, sulfasalazine, hydroxychoroquine, cyclosporine, D-penicillamine, and gold may be employed. Biological response-modifying drugs that inhibit cytokines or leukocytes are another means of treating this auto-immune condition.

NSAID risks, especially gastric ulceration and bleeding, are well-known and increase with advanced age. To help reduce these, selective cyclooxygenase(COX)-2 inhibitors have been developed, but they have their own adverse effects and a potentials for drug interactions. Inconsistent results with these approaches had led again to prescribing prednisone, though it is preferably reserved for extreme cases and used in lower doses.

Many adults use OTC painkilling medications more frequently than recommended, and may take more pills than the label directs. Analgesics such as acetaminophen are commonly used for exacerbations of chronic inflammation to help avoid further NSAID use. Acetaminophen hepatotoxicity from overdose is often associated with co-ingestion of other drugs. So, when health professionals combine analgesics with NSAIDs, they are legitimately concerned about the risk of adverse effects. This is one opportunity to consider using herbal alternatives.

All drug treatments have both advantages and drawbacks that differ depending on the type of drug. **Drugs considered here in interactions with herbs are grouped as corticosteroids** (cortisone, dexamethasone, hydrocortisone, prednisone), **NSAIDs** (acemetacin, 5-aminosalicylates, aspirin, celecoxib, diclofenac, ibuprofen, ketoprofen, metamizol, naproxen, piroxicam, phenylbutazone, propyphenazon, rofecoxib, sulfasalazine), and **analgesics** (acetaminophen [paracetamol], codeine, propoxyphene HCl, tramadol).

E.3.1-3.5 Inflammatory disorders are typified by elevations in products of cyclooxygenase and lipoxygenase pathways. Herbal preparations have been shown to impact a wide variety of these inflammation factors. In most studies involving oral herbal use to treat chronic arthritic inflammations, the inclusion criteria allow a maintenance dose of disease-modifying drugs, NSAIDs or analgesics. **Herbs (h) and their extracts (e), fractions (f), and components (c) are considered here as anti-inflammatory and analgesic adjuvants when they enhance the clinical effects of these drugs, reduce their adverse effects, or reduce their use (frequency or dose) by humans.** When a study has shown a **combination is no more effective than the drug(s) alone, this is indicated in brackets as being [not effective].**

Some botanical derivatives or components produce additional anti-inflammatory and/or analgesic effects if used with drugs when applied **topically (t)**. Other oral herbs or their derivatives protect against ulcers caused by anti-inflammatory drugs **in humans (in bold)** or **in animals (*italicized*) studies**. Still others have been shown to protect against hepatotoxic effects of acetaminophen in animals. Such complementary effects make the

use of herbal products combined with some drugs an attractive means of improving outcomes for inflammation while allaying adverse effects.

[A.1.4 & B.5 A major concern is increasing possible gastric hemorrhage induced by NSAIDs, especially enhancement of anti-platelet activity of aspirin. Herbs that contain natural prodrugs like salicin and coumarin do not have the same anti-platelet or anticoagulant effects of the structurally-similar synthetic derivatives aspirin or warfarin. A few such herbals have been associated with bleeding problems when combined with the anticoagulant warfarin (Coumadin®). However, the vast majority of these interaction risks are best described as "potential," that is, theoretical. Some herbs used as anti-inflammatories like ginger, feverfew, turmeric, and willow do have limited anti-platelet activity but have not been reported as producing hemorrhagic drug interactions in humans.]

(**Major references: 1535**)

E.3.1 Enhancing the Effects of Corticosteroids

Aloe leaf gel (*Aloe vera*) – *te*[212]
Black currant seed (*Ribes nigrum*) – **f**[1399]
Borage seed (*Borago officinalis*) – **f**[1401,1402]
Bromelain pineapple stem extract (*Ananus comosus*) – **e**[1406]
Cayenne fruit *(*Capsicum* spp.) – **tc**[1540]
Licorice root *(*Glycyrrhiza glabra*) – **tc**[213]
Thunder god vine peeled roots *(*Tripterygium wilfordii*) – **e**[1417,1418,2606]
Turmeric root (*Curcuma longa, C. aromatica*) – **c**[2195]
Wormwood herb *(*Artemisia absinthium*) – **h**[2201]
Yucca entire plant (*Yucca* spp.) – **e**[1536]

E.3.2 Enhancing Non-Steroidal Anti-Inflammatory Drugs (NSAIDs)

Black currant seed (*Ribes nigrum*) – **f**[1399]
Borage seed (*Borago officinalis*) – **f**[1401,1402]
Bromelain pineapple stem extract (*Ananus comosus*) – **e**[1405,1406] [not **e**[2152]]
Cayenne fruit *(*Capsicum frutescens*) – **tc**[1540]
Devil's claw roots/tubers (*Harpagophytum procumbens*) – **e,**[1368] **h**[1411]
Dog rose hips (*Rosa canina*) – **h**[2564,2565,2566]
Evening primrose seed (*Oenothera biennis*) – **f**[1400,1537]
Feverfew herb (*Tanacetum parthenium* – [not **h**[1538]]
Frankincense gum resin (*Boswellia serrata*) –**e**[1534,2483]
French maritime pine bark (*Pinus pinaster*) – **f**[2324,2526]
Ginger root/rhizome (*Zingiber officinale*) – **h,**[1408] **tf**[2484]
Kutaki root (*Picrorhiza kurroa*) – *e*[2276]
Red algae (*Lithothamnion corallioides*) – **e**[2583]
Stinging nettle leaves (*Urtica dioica*) – **h**[386]
Thunder god vine peeled roots *(*Tripterygium wilfordii*) – **e**[1417,1418,2606]
Turmeric root (*Curcuma longa, C. aromatica*) – **c**[2195]
Willow bark (*Salix* spp.) – **e**[1390]
Wormwood herb *(*Artemisia absinthium*) – **h**[2201]

E.3.3 Enhancing Outcomes When Using Analgesics

Bromelain pineapple stem extract (*Ananas comosus*) – **e**[1405,1406] [not **e**[2152]]
Cayenne fruit *(*Capsicum frutescens*) – **tc**[1540]
Devil's claw roots/tubers (*Harpagophytum procumbens*) – **h,**[1411] **e**[1412]
Dog rose hips (*Rosa canina*) – **h**[2565,2566]
Evening primrose seed (*Oenothera biennis*) – **f**[1400] [not **f**[1403]]
Feverfew herb (*Tanacetum parthenium* – [not **h**[1538]]
French maritime pine bark (*Pinus pinaster*) – **f**[2324]
Ginger root/rhizome (*Zingiber officinale*) – **e,**[1409] **tf**[2484] [not: **e**[1420]]
Willow bark (*Salix* spp.) – **e**[769,1390]

E.3.4 Protecting Against NSAID-induced Ulcers

Bilberry fruit (*Vaccinium myrtillus*) – *c*[624]
Cat's claw root (*Uncaria tomentosa, U. guianensis*) – *e*[597,1389,1784]
Cayenne fruit *(*Capsicum* spp.) – **h**[211]
Chokeberry fruit (*Aronia melanocarpa*) fruit – *e*[1983]
Commiphora bark gum (*Commiphora caudata*) – *e*, *f*[2682]
Dong quai root (*Angelica sinensis*) – *e*[1101]
Frankincense resin (*Boswellia serrata*) - *e*[2662]
Ginger root/rhizome (*Zingiber officinale*) – *e*[506]
Gynostemma plant (*Gynostemma pentaphyllum*) – *e*[2125]
Licorice root *(*Glycyrrhiza glabra*) – *h,e,*[1006] **e**[220]
Mango bark (*Mangifera indica*) – *c*[2263]
Neem bark or leaves (*Azadirachta indica*) – *e*[2518,2519]
Tea leaves (*Camellia sinensis*) – *e*[492]
Turmeric root (*Curcuma longa*) – *h*[350]
Yarrow herb (*Achillea millefolium*) – *e*[2204]

E.3.5 Protecting Against Acetaminophen-induced Liver Toxicity

Barberry bark (*Berberis* spp.) – *c*[1215]
Burdock root Arctium lappa) – *e*[1404]
Garlic cloves *(*Allium sativum*) – *h,*[540] *c*[1816] [not aged *e*[1099]]
Goldthread root (*Coptis* spp.) – *c*[1215]
Licorice root *(*Glycyrrhiza glabra*) – *e,c,*[558] *c*[1099]
Milk thistle fruit (*Silybum marianum*) – *c,*[117] *f*[2681]
Oregon grape bark (*Mahonia* spp.) – *c*[1215]
Sweta salmali bark (*Ceiba pentandra*) – *f*[2681]

E.4 Enhancing Chemotherapy and Chemoprevention or Reducing the Adverse Effects

It is growing increasingly commonplace for cancer patients to self-administer dietary supplements while undergoing chemotherapy and/or radiation therapy for cancer. This