Herb	Drug	Potential Interaction	Basis of Concern	Recommended Action
Baical Skullcap *Scutellaria baicalensis*	**Losartan**	May increase drug levels.	Clinical trial with healthy volunteers (water-based extract,A dried herb equivalent: 12 g/day).1	**Monitor** (low level of risk at typical doses).
Baical Skullcap *Scutellaria baicalensis*	**Rosuvastatin**	May decrease drug levels.	Clinical study with healthy volunteers using 150 mg/day of isolated constituent (baicalin).2	**Monitor** (low level of risk).B
BarberryC *Berberis vulgaris*	**Drugs that displace the protein binding of bilirubin** eg phenylbutazone	May potentiate effect of drug on displacing bilirubin.	**Herb Alone** Theoretical concern based on *in vitro* data (displaced bilirubin from albumin) and in animals with high dose of berberin by injection (reduced bilirubin serum protein binding).3	**Monitor** (low level of risk).
Bilberry *Vaccinium myrtillus*	**Warfarin**	Potentiation of bleeding.	**Herb Alone** Antiplatelet activity observed in healthy volunteers (173 mg/day of bilberry anthocyanins).4 Case report of postoperative bleeding (bilberry extract undefined).5 **Herb or Constituent and Drug** Uncontrolled trial (600 mg/day of bilberry anthocyanins + 30 mg/day of vitamin C for 2 months then reduced maintenance dose) of 9 patients taking anticoagulant drugs – treatment reduced retinal haemorrhages without impairing coagulation.6 Case report (patient reported to consume "large amounts of bilberry fruits every day for five years").7	**Monitor** at high doses (> 100 mg/day anthocyanins, low level of risk).
Black Cohosh *Actaea racemosa (Cimicifuga racemosa)*	**Statin drugs** eg atorvastatin	May potentiate increase in liver enzymes, specifically ALT.	Case report.8	**Monitor** (low level of risk).
Bladderwrack *Fucus vesiculosus*	**Hyperthyroid medication** eg carbimazole	May decrease effectiveness of drug due to natural iodine content.9	Theoretical concern, no cases reported.	**Contraindicated** unless under close supervision.

Herb	Drug	Potential Interaction	Basis of Concern	Recommended Action
Bladderwrack *Fucus vesiculosus*	**Thyroid replacement therapies** eg thyroxine	May add to effect of drug.	Theoretical concern linked to a case report where “kelp” caused hyperthyroidism in a person not taking thyroxine.[10]	**Monitor** (low level of risk).
Bugleweed *Lycopus virginicus, Lycopus europaeus*	**Radioactive iodine**	May interfere with administration of diagnostic procedures using radioactive isotopes.[11]	Case report.	**Contraindicated.**
Bugleweed *Lycopus virginicus, Lycopus europaeus*	**Thyroid hormones**	Should not be administered concurrently with preparations containing thyroid hormone.[12]	Theoretical concern based on deliberations of German Commission E.	**Contraindicated.**
Cat's Claw *Uncaria tomentosa*	**HIV protease inhibitors**	May increase drug level.	Case report, in a patient with cirrhosis being evaluated for a liver transplant.[13]	**Monitor** (low level of risk).
Cayenne (Chilli Pepper) *Capsicum* spp. (See also Polyphenol-containing herbs)	**ACE inhibitor**	May cause drug-induced cough.	Case report (topical capsaicin). Theoretical concern since capsaicin depletes substance P.[14]	**Monitor** (very low level of risk).
Cayenne (Chilli Pepper) *Capsicum* spp.	**Theophylline**	May increase absorption and drug level.	Clinical study (healthy volunteers, chilli-spiced meal). Absorption and drug level lower than during fasting.[15]	**Monitor** (low level of risk).

Herb	Drug	Potential Interaction	Basis of Concern	Recommended Action
(See also Polyphenol-containing herbs)				
Celery Seed *Apium graveolens*	**Thyroxine**	May reduce serum levels of thyroxine.	Case reports.16	**Monitor** (very low level of risk).
Coleus *Coleus forskohlii*	**Antiplatelet and anticoagulant drugs**	May alter response to drug.	Theoretical concern initially based on *in vitro* antiplatelet activity of active constituent forskolin, and *in vivo* antiplatelet activity in an animal model (oral doses: standardised Coleus extract and forskolin).17 More recent *in vivo* animal research: standardised Coleus extract reduced the anticoagulant activity of warfarin.18	**Monitor** (low level of risk).
Coleus *Coleus forskohlii*	**Hypotensive medication**	May potentiate effects of drug.	Theoretical concern based on ability of high doses of forskolin and standardised Coleus extract to lower blood pressure in normotensive and hypertensive animals.19,20 Clinical data from weight management trials: no effect on blood pressure in three trials, trend toward lower blood pressure in one small study.21,22 No experimental or clinical studies conducted with hypotensive medication.	**Monitor** (low level of risk).
Coleus *Coleus forskohlii*	**Prescribed medication**	May potentiate effects of drug.	Theoretical concern based on ability of forskolin to activate increased intracellular cyclic AMP *in vitro*.23	**Monitor** (low level of risk).
Cranberry *Vaccinium macrocarpon*	**Midazolam**	May increase drug levels.	Clinical trials with healthy volunteers: effect on drug levels conflicting – increased (double-strength juice,D 240 mL tds; defined as a weak interactionE)24 and no effect (cranberry juice,F 200 mL tds).25	**Monitor** (low level of risk).
Cranberry *Vaccinium macrocarpon*	**Simvastatin**	May increase side effects of drug.	Case report (355-473 mL/day cranberry juice drink (7% juice), rated as 'possible' interaction).26	**Monitor** (low level of risk).
Cranberry	**Warfarin**	May alter INR (most frequently increase).	Case reports (where reported the dosage was often high: up to 2000 mL/day, juice strength undefined; 1.5-2 quarts (1420-	**Monitor** (low level of risk at typical doses).

Herb	Drug	Potential Interaction	Basis of Concern	Recommended Action
Vaccinium macrocarpon			1893 mL)/day of cranberry juice cocktail; 113 g/day, cranberry sauce).27,28,29,30,31,32,33,34,35 Clinical trials: no significant effect found in atrial fibrillation patients (250 mL/day cranberry juice cocktail),36 in patients on warfarin for a variety of indications (8 oz (236 mL)/day cranberry juice cocktail),37 but increase was observed in healthy volunteers (juice concentrate equivalent to 57 g of dry fruit/day).38 No alteration of prothrombin time in patients on stable warfarin therapy (480 mL/day cranberry juice)39 or of thromboplastin time in healthy volunteers (600 mL/day cranberry juiceF).25*See also note* D.	
Dan Shen *Salvia miltiorrhiza*	**Midazolam**	May decrease drug levels.	Clinical trial with healthy volunteers.40	**Monitor** (medium level of risk).
Dan Shen *Salvia miltiorrhiza*	**Warfarin**	May potentiate effect of drug.	Case reports: increased INR.41,42,43	**Contraindicated.**
Devil's Claw *Harpagophytum* spp.	**Warfarin**	May increase bleeding tendency.	Case report (purpura) with very few details.44 Unlikely to occur.	**Monitor** (very low level of risk).
Dong Quai *Angelica sinensis, Angelica polymorpha*	**Warfarin**	May potentiate effect of drug.	Case reports: increased INR and PT;45 increased INR and widespread bruising.46	**Monitor** (low level of risk).
Echinacea *Echinacea angustifolia, Echinacea purpurea*	**Antiretroviral drugs**	**HIV non-nucleoside transcriptase inhibitors** eg etravirine: May alter drug levels.	Clinical trial (*E. purpurea* root; HIV-infected patients): no effect overall but large interindividual variability occurred (from near 25% decreases to up to 50% increases in drug concentrations). All maintained an undetectable viral load.47	**Monitor** (low level of risk).
Echinacea *Echinacea angustifolia, Echinacea*	**Antiretroviral drugs (2)**	**HIV protease inhibitors** e.g. darunavir: May	Clinical trial (*E. purpurea* root; HIV-infected patients): no effect overall, but some patients showed a decrease by as	**Monitor** (low level of risk).

Herb	Drug	Potential Interaction	Basis of Concern	Recommended Action
purpurea		decrease drug levels.	much as 40%. All maintained an undetectable viral load. (Patients were also taking a low dose of ritonavir.)[48]	
Echinacea *Echinacea angustifolia, Echinacea purpurea*	**Immunosuppressant medication**	May decrease effectiveness of drug.[49,50]	Theoretical concern based on immune-enhancing activity of Echinacea. No cases reported.	**Contraindicated.**
Echinacea *Echinacea angustifolia, Echinacea purpurea*	**Midazolam**	Decreases drug levels when drug administered intravenously.[G]	Clinical study (*E. purpurea* root, 1.6 g/day).[51]	**Monitor** (medium level of risk) when drug administered intravenously.
Evening Primrose Oil *Oenothera biennis*	**Phenothiazines**	May decrease effectiveness of drug.	Reports of worsening epilepsy in schizophrenics. No causal association demonstrated and no effect observed in later trials.[52]	**Monitor** (very low level of risk).
Garlic *Allium sativum* (See also Hypoglycaemic herbs)	**Antiplatelet and anticoagulant drugs**	Aspirin: May increase bleeding time. Clopidogrel: May potentiate effect of drug. Warfarin: May potentiate effect of drug. Large doses could increase bleeding tendency.	Concern may be overstated, as antiplatelet/anticoagulant drugs are often coadministered eg aspirin and warfarin. **Herb Alone** Case reports of increased bleeding tendency with high garlic intake. In three of the four cases the bleeding occurred after surgery.[53,54,55,56] Anecdotal: garlic taken shortly before testing interferes with platelet aggregation in control subjects.[57] *Single-dose studies, and studies demonstrating a beneficial effect on disordered function, including for example, in atherosclerosis, are excluded.* Clinical studies (3 g/day or less of fresh garlic): inhibited platelet aggregation in three trials† (about 2.4-2.7 g/day,	**Monitor** at doses equivalent to ≥ 3 g/day fresh garlic (low level of risk). **Stop taking** at least one week before surgery.

Herb	Drug	Potential Interaction	Basis of Concern	Recommended Action
			patients and healthy volunteers)58,59,60 but no effect on platelet aggregation in one trial† (about 1.8 g/day, patients);61 decreased serum thromboxane in one trial (3 g/day, healthy volunteers) 62.† *See note* H. Clinical studies (4.2–5 g/day of fresh garlic, patients and healthy volunteers): no effect on platelet aggregation, fibrinogen level, prothrombin time, whole blood coagulation time.63,64,65 Clinical studies (8-10 g/day of fresh garlic, healthy volunteers): inhibited platelet aggregation and increased clotting time.66,67 **Herb and Drug** Aspirin: No published studies. Clopidogrel: Garlic tablet ("odorless", dose undefined) added to improve drug therapy, reduced platelet hyperactivity in two patients.57 Warfarin: Two cases of increased INR and clotting times, very few details (garlic pearls, garlic tablets: dosage undefined).68 Clinical trial: no effect in healthy volunteers (enteric-coated tablets equivalent to 4 g/day of fresh garlic).38	
Garlic *Allium sativum*	**HIV protease inhibitors**	Decreases drug level.	Saquinavir: Two clinical studies (garlic extract, standardised for allicin content) with healthy volunteers69,70 – large variability (in one study,70 decrease (15%) was not	**Monitor** (medium level of risk).

Herb	Drug	Potential Interaction	Basis of Concern	Recommended Action
			significant). Ritonavir-boosted atazanavir: Case report (6 stir-fried garlic cloves three times per week).[71]	
(See also Hypoglycaemic herbs)				
Ginger *Zingiber officinale*	**Antacids**	May decrease effectiveness of drug.	Theoretical concern since ginger increases gastric secretory activity *in vivo* (animals).[49]	**Monitor** (low level of risk).
Ginger *Zingiber officinale*	**Antiplatelet and anticoagulant drugs**	Phenprocoumon: May increase effectiveness of drug.	Case report (dosage undefined): increased INR.[72]	**Monitor** at doses equivalent to < 4 g/day dried ginger (low level of risk).
Ginger *Zingiber officinale*	**Antiplatelet and anticoagulant drugs (2)**	Warfarin: Increased risk of spontaneous bleeding.	Concern based on antiplatelet activity and potential to inhibit thromboxane synthetase. **Herb Alone** Clinical studies: inhibition of platelet aggregation (5 g, divided single dose, dried ginger) in healthy volunteers,[73] and coronary artery disease patients (10 g, single dose, dried ginger),[74] but no effect in healthy volunteers (2 g, single dose, dried ginger),[75] or coronary artery disease patients (4 g/day, dried ginger);[74] inhibition of platelet thromboxane production in healthy volunteers (5 g/day, fresh ginger).[76] **Herb and Drug** Case report: bleeding (ginger dosage undefined).[77] No pharmacokinetic or pharmacodynamic effect demonstrated in a clinical trial with healthy volunteers (3.6 g/day, dried ginger).[78] Epidemiological study: ginger (as a complimentary medicine) was significantly associated with an increased risk	**Monitor** at doses equivalent to < 4 g/day dried ginger (very low risk). **Contraindicated** unless under close supervision at doses equivalent to > 4 g/day dried ginger.

Herb	Drug	Potential Interaction	Basis of Concern	Recommended Action
			of self-reported bleeding in patients taking warfarin.[79] These results should be viewed cautiously (*see note* I).	
Ginger *Zingiber officinale*	**Nifedipine**	May produce a synergistic antiplatelet effect.	Clinical study (1 g/day, dried ginger) in healthy volunteers and hypertensive patients.[80]	**Contraindicated.**
Ginkgo[J] *Ginkgo biloba*	**Anticonvulsant medication** eg carbamazepine, sodium valproate	May decrease the effectiveness of drug.	Case reports, two with well-controlled epilepsy,[81] others anecdotal and uncertain.[82,83,84]	**Monitor** (medium level of risk). Increasing the intake of vitamin B6 may be advisable for patients taking anticonvulsants.[K]
Ginkgo[J] *Ginkgo biloba*	**Antiplatelet and anticoagulant drugs**	Prolongation of bleeding and/or increased bleeding tendency.	Concern based on antiplatelet activity. Bleeding events associated with Ginkgo alone or in combination with these and other drugs have been reported but a causal relationship was not established conclusively. Although a retrospective population-based study found risk of haemorrhage was associated with elderly patients (65 years or older) who were taking Ginkgo alone.[85] **Herb Alone** Rare case reports of bleeding.[86,87,88] Meta-analysis of randomised, placebo-controlled trials (healthy volunteers and patients): results indicate standardised Ginkgo extract does not increase the risk of bleeding.[89] Randomised, 5-year trial (elderly participants; Ginkgo 50:1 extract, 240 mg/day, equivalent to 12 g/day of dried leaf): no significant difference in incidence of	**Monitor** (low level of risk).

Herb	Drug	Potential Interaction	Basis of Concern	Recommended Action
			haemorrhagic events.90 **Herb and Drug** Retrospective population-based study in Taiwan: the relative risk of haemorrhage associated with the use of Ginkgo extract combined with drugs (clopidogrel, cilostazol, ticlopidine, warfarin) was not significant.85 *See also note L*. Aspirin: Case reports (2, bleeding;86 one, extensive bruising after a fall – although possibly high Ginkgo dose (400 mg/day, undefined)).91 Clinical studies: no additional effect on platelet function, platelet aggregation or bleeding time.92,93,94 Cilostazol: Clinical study with healthy volunteers (Ginkgo extract (undefined): single dose 120 mg) – bleeding time prolonged; no change in platelet aggregation or clotting time, and no significant correlation between prolongation of bleeding time and inhibition of platelet aggregation;95 no effect on pharmacokinetics or bleeding time, the increase in platelet aggregration was not significant (Ginkgo extract (undefined): 160 mg/day).96 Clopidogrel: Case report (bruising and bleeding).97 Clinical study with healthy volunteers (Ginkgo extract (undefined): single dose 120 mg) – no effect on platelet aggregation, bleeding times.95 Ticlopidine: Case report (bleeding).87 Clinical studies: no significant additional effect on bleeding time or platelet	

Herb	Drug	Potential Interaction	Basis of Concern	Recommended Action
			aggregation (Ginkgo 50:1 extract: single dose 80 mg, equivalent to 4 g of dried leaf; healthy volunteers),98 and at the higher dose (120 mg/day) did not affect drug levels;99 increased inhibitory response of platelets to testing with two agonists (i.e. antiplatelet effect) for drug and herb compared with drug alone, although effect was small and statistical and clinical signficance is unknown (Ginkgo extract (undefined): 160 mg/day; pilot study of patients who had an acute ischaemic stroke or transient ischaemic attack).100 Warfarin: Case report (bleeding).86 Clinical studies (healthy volunteers and patients): no additional effect on INR, platelet aggregation, coagulation parameters or plasma drug level.78,101,102	
GinkgoJ *Ginkgo biloba*	**Antipsychotic medication** eg haloperidol, olanzapine, clozapine	May potentiate the efficiency of drug in patients with schizophrenia.	Randomised, controlled trials (Ginkgo 50:1 extract: 120-360 mg/day, equivalent to 6-18 g/day of dried leaf).103,104,105,106	Prescribe cautiously. **Reduce** drug if necessary in conjunction with prescribing physician.
GinkgoJ *Ginkgo biloba*	**Antiretroviral drugs**	**HIV integrase inhibitors** e.g. raltegravir: May alter drug levels.	Clinical study with healthy volunteers (Ginkgo 50:1 extract: 240 mg/day, equivalent to 12 g/day of dried leaf) found an increase in plasma levels, due to large interindividual variability, not considered to be of clinical importance. (The drug's pharmacokinetics are known for considerable intra- and interindividual variability.) 107	**Monitor** (low level of risk).
GinkgoJ *Ginkgo biloba*	**Antiretroviral drugs (2)**	**HIV non-nucleoside transcriptase inhibitors** e.g. efavirenz: May decrease drug levels.	Case report.108	**Monitor** (medium level of risk).

Herb	Drug	Potential Interaction	Basis of Concern	Recommended Action
GinkgoJ *Ginkgo biloba*	**Benzodiazepines** eg alprazolam, diazepam, midazolam	May alter drug level.	Alprazolam: Clinical trial in healthy volunteers found no effect (Ginkgo 50:1 extract: 240 mg/day, equivalent to 12 g/day of dried leaf).109 Diazepam: Clinical trial in healthy volunteers found no effect (Ginkgo 50:1 extract: 240 mg/day, equivalent to 12 g/day of dried leaf).110 Midazolam: Clinical trials in healthy volunteers found conflicting results on drug levels: increased (defined as a weak interactionE; Ginkgo 50:1 extract: 360 mg/day, equivalent to 18 g/day of dried leaf),111 decreased (Ginkgo 50:1 extract: 240 mg/day, equivalent to 12 g/day of dried leaf)112 and no effect (Ginkgo 50:1 extract: 240 mg/day, equivalent to 12 g/day of dried leaf).113	**Monitor** (low level of risk).
GinkgoJ *Ginkgo biloba*	**Hypoglycaemic drugs**	Glipizide: May cause hypoglycaemia.	Observation from aborted trial: hypoglycaemia occurred in volunteers with normal glucose tolerance within 60 minutes.114 Ginkgo 50:1 extract was administered as a single dose of 120 mg, equivalent to 6 g of dried leaf.115	**Monitor** (low level of risk).
GinkgoJ *Ginkgo biloba*	**Hypoglycaemic drugs (2)**	Metformin: May enhance effectiveness of drug	Clinical trial: elimination half-life was increased at doses of metformin 850 mg, three times a day. Effect not significant at doses to 500 mg, twice a day. Ginkgo 50:1 extract was administered as a single dose of 120 mg, equivalent to 6 g of dried leaf.114	**Monitor** at doses of metformin > 1 g/day (medium level of risk). **Reduce** drug if necessary in conjunction with prescribing physician.
GinkgoJ *Ginkgo biloba*	**Hypoglycaemic drugs (3)**	Pioglitazone: May increase drug level.	Clinical trial with healthy volunteers (Ginkgo 50:1 extract: 120 mg/day, equivalent to 6 g/day of dried leaf).116	**Monitor** (low level of risk).
GinkgoJ	**Hypoglycaemic drugs (4)**	Tolbutamide: May decrease effectiveness of	Clinical trials with healthy volunteers: nonsignificant reduction in glucose-lowering effect of drug (Ginkgo 50:1 extract: 360	**Monitor** (low level of risk).

Herb	Drug	Potential Interaction	Basis of Concern	Recommended Action
Ginkgo biloba		drug.	mg/day, equivalent to 18 g/day of dried leaf);111 pharmacokinetics not altered (Ginkgo 50:1 extract: 240 and 360 mg/day). 111,113	
GinkgoJ *Ginkgo biloba*	**Nifedipine**	May increase drug levels or side effects.	Clinical studies: mixed results found for mean plasma drug level – increase (120 mg/day, equivalent to 6 g/day of dried leaf)117 and no effect (240 mg/day, equivalent to 12 g/day of dried leaf).118 However, at the higher dose, maximal plasma drug level and heart rate was increased with adverse drug reactions for participants with highest plasma drug levels (headache, dizziness, hot flushes).118	**Monitor** at doses < 240 mg/day, equivalent to < 12 g/day of dried leaf (medium level of risk). **Contraindicated** for higher doses.
GinkgoJ *Ginkgo biloba*	**Omeprazole**	May decrease drug levels.	Clinical trials with healthy volunteers found conflicting results on drug levels: decreased (Ginkgo 50:1 extract: 280 mg/day, equivalent to 14 g/day of dried leaf);119 and no effect (Ginkgo 50:1 extract: 240 mg/day equivalent to 12 g/day of dried leaf).113	**Monitor** (low level of risk).
GinkgoJ *Ginkgo biloba*	**Statin drugs**	May decrease drug levels.	Atorvastatin: Clinical study with healthy volunteers (Ginkgo 50:1 extract: 360 mg/day, equivalent to 18 g/day of dried leaf). No pharmacodynamic effect was observed.120 Simvastatin: Clinical study with healthy volunteers (Ginkgo 50:1 extract: 240 mg/day, equivalent to 12 g/day of dried leaf) – drug levels decreased, but active metabolite drug levels not affected. Pharmacodynamics (cholesterol lowering) of the drug not significantly affected, although trend towards lowering of LDL-cholesterol efficacy observed.121	**Monitor** (Low level of risk)
GinkgoJ *Ginkgo biloba*	**Talinolol**	May increase drug levels.	Clinical trial with healthy volunteers.122	**Monitor** (low level of risk).
Golden Seal^	**Drugs which displace**	May potentiate effect of	**Herb Alone**	**Monitor** (low level of

Herb	Drug	Potential Interaction	Basis of Concern	Recommended Action
Hydrastis canadensis	**the protein binding of bilirubin** eg phenylbutazone	drug on displacing bilirubin.	Theoretical concern based on *in vitro* data (displaced bilirubin from albumin) and in animals with high dose of berberine by injection (reduced bilirubin serum protein binding.)3	risk).
Golden Seal^ *Hydrastis canadensis*	**Midazolam**	May increase drug level.	Clinical trial (defined as a weak interactionE).123	**Monitor** (low level of risk).
Green Tea *Camellia sinensis* (See also Polyphenol-containing herbs and Tannin-containing herbs)	**Boronic acid-based protease inhibitors** eg bortezomib	May decrease efficacy of drug.	Theoretical concern based on initial *in vitro* data and *in vivo* animal study (green tea constituent: EGCG reduced tumour cell death induced by drug).124 However, a further *in vivo* animal study found EGCG was not antagonistic to the activity of the drug.125 *See note* M.	**Contraindicated** at high doses (around 600 mg/day EGCG or 1 g/day green tea catechins).N More information required for doses below this level.
Green Tea *Camellia sinensis* (See also Polyphenol-containing herbs and Tannin-containing herbs)	**Folate**	May decrease absorption.	Clinical study with healthy volunteers.126 Clinical significance unclear, as was a one-day study (i.e. not ongoing administration), with 50 mg of green tea catechins administered before, during and up to 2 hours after folate (for a total of 250 mg of catechins).	If taken simultaneously, may need to **increase** dose of folate. The effect may be relatively small - more information is required.
Green Tea *Camellia sinensis*	**Immunosuppressives**	May increase drug levels.	Case report (patient was a CYP3A4 poor metabolizer).127	**Monitor** (medium level of risk).

Herb	Drug	Potential Interaction	Basis of Concern	Recommended Action
(See also Polyphenol-containing herbs and Tannin-containing herbs)				
Green Tea *Camellia sinensis*	**Sildenafil**	May increase bioavailability of drug.	Clinical study with healthy volunteers (2 g, single dose, green tea powder containing 60 mg catechins). Blood pressure and electrocardiogram were unchanged.128	**Monitor** (low level of risk).
(See also Polyphenol-containing herbs and Tannin-containing herbs)				
Green Tea *Camellia sinensis*	**Statin drugs** eg simvastatin	May increase plasma level and side effect of drug.	One case reported of muscle pain (side effect). Pharmacokinetic evaluation indicated green tea (1 cup) increased the bioavailability of simvastatin in this patient.129	**Monitor** (low level of risk).
(See also Polyphenol-containing herbs and Tannin-containing herbs)				
Green Tea *Camellia sinensis*	**Sunitinib**	May reduce bioavailability of drug.	Case report (effect appeared dose-dependent). Considering the pharmacokinetic data (interaction in mice), the authors recommended avoiding green tea intake or leaving an interval of 4 hours between beverage and drug intake.130	**Contraindicated**, unless **taken** at least 4 hours **apart**.
(See also Polyphenol-containing herbs and Tannin-containing herbs)				

Herb	Drug	Potential Interaction	Basis of Concern	Recommended Action
Green Tea *Camellia sinensis* (See also Polyphenol-containing herbs and Tannin-containing herbs)	**Warfarin**	May inhibit effect of drug: decreased INR.	Case report (brewed green tea: 0.5-1 gallon/day).131	**Monitor** (very low level of risk).
Hawthorn *Crataegus monogyna, Crataegus laevigata, (C. oxyacantha)* (See also Tannin-containing herbs)	**Digoxin**	May increase effectiveness of drug.	Clinical studies indicate a (beneficial) synergistic effect.132,133 Pharmacokinetics not affected in a clinical study (healthy volunteers).134	**Monitor** (low level of risk).
Hawthorn *Crataegus monogyna, Crataegus laevigata, (C. oxyacantha)* (See also Tannin-containing herbs)	**Hypotensive drugs**	May increase effectiveness of drug.	Controlled trials where drugs known to be taken by all or many heart disease patients: blood pressure decreased significantly (2 trials),135,136 decreased nonsignificantly (1 trial)137 and was unchanged (1 trial).138 Significant decrease in blood pressure observed in diabetics taking hypotensive drugs (1 trial).139	**Monitor** (very low level of risk).
Hypoglycaemic herbs eg *Gymnema sylvestre,* goat's rue (*Galega officinalis*), fenugreek	**Hypoglycaemic drugs** including insulin	May potentiate hypoglycaemic activity of drug.	In uncontrolled trials, high dose, long-term administration of Gymnema extract (equivalent to 10-13 g/day dried leaf) reduced insulin and hypoglycaemic drug requirements in	Prescribe cautiously and monitor blood sugar regularly. **Warn** patient about possible

Herb	Drug	Potential Interaction	Basis of Concern	Recommended Action
(*Trigonella foenum-graecum*), psyllium (*Plantago ovata, P. indica*) (See also Ginkgo, Korean Ginseng, St John's Wort, St Mary's Thistle)			diabetics.[140,141] Hypoglycaemic effects of fenugreek (15–100 g/day dried and/or defatted seed) observed in type 1 and type 2 diabetics including those on therapeutic and subtherapeutic doses of hypoglycaemic drugs.[142,143,144,145,146,147] No effect on glucose or insulin responses in women with PCOS treated with metformin and fenugreek (concentrated extract, equivalent to about 10 g/day dried and fresh seed).[148] Hypoglycaemic effects observed in many well-controlled clinical trials for psyllium (10.2–15 g/day, more than 6 weeks) in type 2 diabetics. Drug dosage adjustments were not required.[149,150,151,152] *See also note* O. In one small, uncontrolled trial, nearly 70% of type 1 diabetics experienced hypoglycaemic episodes. Reductions in insulin dosage may have been required had the trial been of longer duration (10.8 g/day of husk, about 1 week).[153] (There is also clinical evidence that high fibre diets (10–60 g/day) worsen control of type 2 diabetes in patients who are poorly controlled with oral hypoglycaemic drugs.[154]) Several trials have found no effect for garlic on blood glucose in type 2 diabetes, although in a double-blind, placebo-controlled trial (using enteric-coated tablets), a reduction in the dosage of oral hypoglycaemic drugs was required (these patients had fasting blood glucose above 8.0 mmol/L).[155]	hypoglycaemic effects. **Reduce** drug if necessary in conjunction with prescribing physician.
Kava *Piper methysticum*	**CNS depressants** eg alcohol, barbiturates, benzodiazepines	Potentiation of drug effects.	Theoretical concern based on deliberations of German Commission E[12] and the anxiolytic activity of kava.[49] Two apparent case reports (kava + benzodiazepines (alprazolam, flunitrazepam)).[156,157] Clinical trials with healthy volunteers:	**Monitor** (low level of risk).

Herb	Drug	Potential Interaction	Basis of Concern	Recommended Action
			no additional side effects observed for kava (extract containing 240 mg/day of kava lactones) + benzodiazepine (bromazepam),[158] and kava (extract containing 210 mg/day of kava lactones) + alcohol.[159] Clinical study with healthy volunteers: no effect on pharmacokinetic parameters of midazolam (extract provided 253 mg/day of kava lactones).[123]	
Kava *Piper methysticum*	**L-dopa** and other Parkinson's disease treatments	Possible dopamine antagonist effects.	Case reports.[160,161] Although, kava is unlikely to be responsible for central dopaminergic antagonism (experimental model)[162] and kava reduced parkinsonism induced by neuroleptic drugs (observational study, psychiatric patients).[163]	**Contraindicated** unless under close supervision.
Korean Ginseng *Panax ginseng*	**Antihypertensive medications** including nifedipine	General: May decrease effectiveness of drug.	Theoretical concern since hypertension is a feature of GAS. Clinical significance unclear.[49] Assessment of 316 hospital patients found Korean ginseng to have a contrary effect only in a very small percentage: blood pressure increase in 5% of hypertensives; increase in 3% and decrease in 2% of normotensives; decrease in 6% of hypotensives.[164] No information on concurrent medications. *Note for clinical trial data below:* Acute, single-dose trials excluded. High doses used in several trials. **Herb Alone** Clinical trials: no significant effects found in healthy volunteers,[165,166] those with metabolic syndrome,[167] type 2 diabetes[168] or glaucoma,[169] although baseline blood pressure may be a factor.[167]	**Monitor** (very low level of risk).

Herb	Drug	Potential Interaction	Basis of Concern	Recommended Action
			Herb and Drug Clinical trials: *decreased* blood pressure in essential hypertension,170 and coronary artery disease171 but no effect in white coat hypertension170 and essential hypertension.172	
Korean Ginseng *Panax ginseng*	**Antihypertensive medications (2)** including nifedipine	Nifedipine: May increase drug levels.	Clinical trial.117	**Monitor** (low level of risk).
Korean Ginseng *Panax ginseng*	**Antiplatelet and anticoagulant drugs**	General: May potentiate effects of drug.	**Herb Alone** Two epidemiological studies in Korea: long-term intake (3-5 years) prolonged plasma clotting times (APTT),173,174 and decreased platelet aggregation.173 (Dosage in Korea is generally high.) Clinical trial (healthy volunteers): inhibited platelet aggregation, but no effect on coagulation (PT, APTT).175	**Monitor** (low level of risk).
Korean Ginseng *Panax ginseng*	**Antiplatelet and anticoagulant drugs (2)**	Warfarin: May decrease effectiveness of drug.	**Herb and Drug** One case reported (decreased INR)176 but clinical significance unclear. No effect demonstrated in three clinical trials (healthy volunteers and patients) for INR, prothrombin time and platelet aggregation.177,178,179 Although the design of the trials has been criticised. *See note* P.180	**Monitor** (low level of risk).
Korean Ginseng *Panax ginseng*	**Cancer chemotherapeutic drugs** eg imatinib	May potentiate adverse effect possibly by altered metabolism.	Case report (hepatotoxicity; probable casuality).181	**Monitor** (low level of risk).

Herb	Drug	Potential Interaction	Basis of Concern	Recommended Action
Korean Ginseng *Panax ginseng*	**CNS stimulants**	May potentiate effects of drug.49	Theoretical concern since CNS stimulation is a feature of GAS. Clinical significance unclear.	**Monitor** (low level of risk).
Korean Ginseng *Panax ginseng*	**HIV integrase inhibitors** eg raltegravir	May potentiate adverse effect possibly by altered metabolism.	Case report (elevated liver enzymes: probable casuality, dosage unknown).182	**Monitor** (low level of risk).
Korean Ginseng *Panax ginseng*	**Hypoglycaemic drugs** including insulin	May potentiate hypoglycaemic activity of drug.50	Theoretical concern based on clinically observed hypoglycaemic activity of ginseng in newly diagnosed type 2 diabetics.183 Clinical significance unclear. No effect on insulin sensitivity or beta-cell function after very high doses in newly diagnosed type 2 diabetics or those with impaired glucose tolerance.184 Korean red ginseng (2.7 g/day) reduced the requirement for insulin in about 40% of diabetics in a small uncontrolled trial.185 No adverse effects in three trials of type 2 diabetics well controlled with diet and/or oral hypoglycaemic drugs.168,186,187	**Monitor** (low level of risk).
Korean Ginseng *Panax ginseng*	**MAO inhibitors** eg phenelzine	May cause side effects such as headache, sleeplessness, tremor.	Case reports.188,189,190	**Contraindicated.**
Korean Ginseng *Panax ginseng*	**Midazolam**	May decrease drug level.	Clinical study with healthy volunteers (extract providing about 45 mg/day of ginsenosides).191	**Monitor** (low level of risk).
Korean Ginseng *Panax ginseng*	**Sildenafil**	Potentiation of drug possible.	Theoretical concern based on *in vitro* studies which show ginseng increases nitric oxide release from corpus cavernosum tissue.192,193	**Monitor** (very low level of risk).
Laxative (anthraquinone-containing) herbs	**Antiarrhythmic agents**	May affect activity if potassium deficiency resulting from long-term	German Commission E and ESCOP recommendation.12,194	**Avoid** excessive doses of laxatives. Maintain patients on a high

Herb	Drug	Potential Interaction	Basis of Concern	Recommended Action
eg aloes resin (*Aloe barbadensis, Aloe ferox*), senna (*Cassia* spp.), cascara (*Frangula purshiana, Rhamnus purshianus*), yellow dock (*Rumex crispus*)		laxative abuse is present.		potassium diet.
Laxative (anthraquinone-containing) herbs eg aloes resin (*Aloe barbadensis, Aloe ferox*), senna (*Cassia* spp.), cascara (*Frangula purshiana, Rhamnus purshianus*), yellow dock (*Rumex crispus*)	**Cardiac glycosides**	May potentiate activity, if potassium deficiency resulting from long-term laxative abuse is present.	German Commission E and ESCOP recommendation.12,194	**Monitor** (low level of risk at normal doses).
Laxative (anthraquinone-containing) herbs eg aloes resin (*Aloe barbadensis, Aloe ferox*), senna (*Cassia* spp.), cascara (*Frangula purshiana, Rhamnus purshianus*), yellow dock (*Rumex crispus*)	**Potassium-depleting agents** eg thiazide diuretics, corticosteroids, licorice root (*Glycyrrhiza glabra*)	May increase potassium depletion.	German Commission E and ESCOP recommendation.12,194	**Avoid** excessive doses of laxatives. Maintain patients on a high potassium diet.
Licorice *Glycyrrhiza glabra*	**Antihypertensive medications** other than diuretics	General: May decrease effectiveness of drug.	When consumed in high doses, licorice can cause pseudoaldosteronism and high blood pressure. **Herb or Constituent Alone** Hypertension demonstrated in case reports, usually from long-term intake and/or very high dose.195 Hypokalaemic paralysis reported (184 mg/day of glycyrrhizin for 2 months), although hypertension was mild, possibly due to coexisting	**Avoid** long-term use at doses > 100 mg/day glycyrrhizin unless under close supervision.S Place patients on a high potassium diet.

Herb	Drug	Potential Interaction	Basis of Concern	Recommended Action
			sodium wasting related to uropathy from prostate cancer.196 Clinical studies (up to 200 g/day of licorice): dose dependent relationship found between licorice and increase in blood pressure, more pronounced effect in hypertensive patients than in normotensive volunteers, adverse effects greater in women, and effect shown for dose as low as 50 g/day of licorice (75 mg/day of glycyrrhetinic acid = 130 mg/day of glycyrrhizinQ) taken for 2 weeks.197,198,199 Other studies show variation of effects on blood pressure (*see note* R) – renal function may be a factor.200 The increase in blood pressure after taking glycyrrhetinic acid (874 mg/day of gycyrrhizin) was more pronounced in salt-sensitive than salt-resistant volunteers.201 Clinical study to establish a no-effect level for glycyrrhizin (healthy female volunteers): significant results (eg blood pressure, serum potassium and aldosterone) compared to controls found for daily dose of 4 mg/kg (220-332 mg/day) taken for 8 weeks, but no effect at lower doses of 1-2 mg/kg (55-166 mg/day) of glycyrrhizin.202 **Herb and Drug** Case reports (licorice tea, 3 L/day; patient still hypertensive despite treatment with drugs;203decoction of Chinese herbs containing 5 g licorice, taken for 14 days).204	
Licorice *Glycyrrhiza glabra*	**Antihypertensive medications (2)** other than diuretics	ACE-inhibitor: May mask the development of pseudoaldosteronism.	Case report (patient consumed licorice herbal medicine (200-240 mg/day glycyrrhizin)). Drug dosage was reduced, leading to pseudoaldoesteronism.205 *See note* T.	**Avoid** long term use at doses > 100 mg/day glycyrrhizin unless under close supervision.S Place patients on a high

Herb	Drug	Potential Interaction	Basis of Concern	Recommended Action
				potassium diet.
Licorice *Glycyrrhiza glabra*	**Cilostazol**	May cause hypokalaemia, which can potentiate the toxicity of the drug.	Case report (patient taking 150 mg/day of glycyrrhizin). Serum potassium levels were stable prior to administration of drug.206	**Monitor** (medium level of risk). Place patients on a high potassium diet.
Licorice *Glycyrrhiza glabra*	**Corticosteroids** eg cortisol (hydrocortisone), prednisolone	Cortisol: May potentiate the action (rather than increase level of drug).	Inhibition of the enzyme 11beta-HSD2 by glycyrrhizin leads to an increased level of cortisol in the kidney. This does not happen in the liver. The plasma half-life of cortisol may be prolonged when herb and drug are coadministered, but drug concentrations remain normal, possibly because of a concomitant fall in cortisol production.207 Prolonged half-life of cortisol may suggest the potential for licorice to prolong clearance (and hence, activity) of the drug. (Studies involving patients with Addison's disease or on haemodialysis are not listed here.) **Herb or Constituent Alone** Clinical studies with healthy volunteers 198,200,208,209,210,211,212,213,214 and patients with essential hypertension198 (ongoing oral administration): increase in urinary excretion of cortisol, but no significant change in plasma cortisol 198,200,208,209,210,211,212,213,214 (although plasma cortisone decreased) 208,209,215 and diurnal variation of plasma cortisol was unaffected.211 Dosage was high: 100-200 g/day of licorice candy (containing glycyrrhizin or glycyrrhetinic acid equivalent to 262-2440 mg/day of glycyrrhizinQ),198,210,211,214 3.5 g/day of licorice tablets (containing 266 mg/day of glycyrrhizin),212 4.8 g/day licorice extract (containing glycyrrhetinic acid = 587 mg/day of	**Monitor** (very low level of risk at normal doses).

Herb	Drug	Potential Interaction	Basis of Concern	Recommended Action
			glycyrrhizin),213 225 mg/day glycyrrhizin,208 glycyrrhetinic acid (= 227-874 mg/day glycyrrhizin).200,209 Clinical study with healthy volunteers and hypertensive patients (single-dose, placebo-controlled; oral administration of glycyrrhetinic acid equivalent to 874 mg/day of glycyrrhizinQ): increased plasma cortisol/cortisone ratio (due mostly to a decrease in plasma cortisone); salivary cortisol increased.216 Clinical study with healthy volunteers (topical application of a cream containing glycyrrhetinic acid): no effect on plasma cortisol.217 **Herb or Constituent and Drug** Clinical studies: increased plasma half-life of cortisol (oral administration of licorice candy (200 g/day, containing 580 mg/day glycyrrhizin) + intravenous cortisol to 7 healthy volunteers; 210 oral administration of glycyrrhetinic acid = 227 mg/day of glycyrrhizinQ + oral cortisol to 2 volunteers).218,219 *See also Note* U. *Ex vivo* study (skin samples from healthy volunteers and patients with psoriasis and eczema; glycyrrhetinic acid and drug topically applied): activity of hydrocortisone potentiated by glycyrrhetinic acid.220	
Licorice *Glycyrrhiza glabra*	**Corticosteroids (2)** eg cortisol (hydrocortisone),	Prednisolone: May potentiate the action or increase levels of drug.	**Herbal Constituent and Drug** Two clinical studies with healthy volunteers(oral administration of glycyrrhizin or glycyrrhetinic acid;Q	**Monitor** (low level of risk at normal doses) when drug administered

Herb	Drug	Potential Interaction	Basis of Concern	Recommended Action
	prednisolone		prednisolone administered intravenously): increased drug level[221] and increased prednisolone/prednisone ratio[V] in urine and plasma.[222] Dosage was high: 200 mg/day glycyrrhizin,[221] and 400 mg/day glycyrrhetinic acid (= 700 mg/day glycyrrhizin).[222]	intravenously.
Licorice *Glycyrrhiza glabra*	**Digoxin**	May cause hypokalaemia which can potentiate the toxicity of the drug.	**Herb Alone** Hypokalaemia demonstrated in case reports and clinical studies, usually from long-term intake and/or very high dose, however effect has been demonstrated in sensitive individuals at low doses (licorice containing 100 mg/day of glycyrrhizin). Side effects would be common at 400 mg/day of glycyrrhizin.[195,223,224] **Herb and Drug** Case report (patient taking herbal laxative containing licorice (1.2 g/day) and rhubarb (*Rheum* spp., 4.8 g/day)). In addition to digoxin, patient was also taking a potassium-depleting diuretic.[225]	**Avoid** long-term use at doses > 100 mg/day glycyrrhizin unless under close supervision.[S] Place patients on a high potassium diet.
Licorice *Glycyrrhiza glabra*	**Diuretics**	Spironolactone (potassium sparing diuretic): Reduce side effects of drug.	Clinical study: in women with PCOS addition of licorice extract (containing about 463 mg/day glycyrrhizin) reduced side effects related to the diuretic activity of drug.[226]	**Monitor** (low level of risk at normal doses).
Licorice *Glycyrrhiza glabra*	**Diuretics (2)**	Thiazide and loop (potassium depleting) diuretics: The combined effect of licorice and the drug could result in excessive potassium loss.[12]	**Herb or Constituent Alone** Hypokalaemia demonstrated in case reports and clinical studies, usually from long-term intake and/or very high dose,[195,223,224] however effect has been demonstrated in patients for ongoing treatment with herbal medicines	**Contraindicated** unless under close supervision at doses > 40 mg/day glycyrrhizin.

Herb	Drug	Potential Interaction	Basis of Concern	Recommended Action
			containing glycyrrhizin at doses of 80–240 mg/day.[227] **Herb and Drug** Case reports, usually from long-term intake and/or very high dose, [203,223,228,229,230,231,232,233,234] however effect has been demonstrated for ongoing treatment at glycyrrhizin as low as 80 mg/day.[227] Clinical trial (candy containing 40 mg/day of glycyrrhizin): decreased plasma potassium, with 20% of healthy volunteers hypokalaemic in the first week.[235]	
Licorice *Glycyrrhiza glabra*	**Immunosuppressives** eg sirolimus	May decrease drug clearance.	Population pharmacokinetic study with 112 Chinese adult renal transplant recipients: clearance of sirolimus decreased in those patients with abnormal ALT values who were taking herbal formulations containing glycyrrhizin (route and dosage unknown).[236]	**Monitor** (medium level of risk) in hepatically-impaired patients.
Licorice *Glycyrrhiza glabra*	**Midazolam**	May decrease drug level.	Clinical study with healthy volunteers (potassium salt of glycyrrhizin, equivalent to 287 mg/day of glycyrrhizin).[237]	**Monitor** (low level of risk at normal doses).
Licorice *Glycyrrhiza glabra*	**Omeprazole**	May decrease drug level.	Clinical study with healthy volunteers (potassium salt of glycyrrhizin, equivalent to 287 mg/day of glycyrrhizin).[238]	**Monitor** (low level of risk at normal doses).
Licorice *Glycyrrhiza glabra*	**Potassium-depleting drugs** other than thiazide and loop diuretics eg corticosteroids, stimulant laxatives	May result in excessive potassium loss.	**Herb Alone** Hypokalaemia demonstrated in case reports and clinical studies, usually from candy intake (high dose), however effect has been demonstrated in sensitive individuals at low doses (licorice containing 100 mg/day of glycyrrhizin). Side effects would be common at 400 mg/day of glycyrrhizin.[195,223]	**Avoid** long-term use at doses > 100 mg/day glycyrrhizin unless under close supervision. Place patients on a high potassium diet.
Marshmallow Root	**Prescribed medication**	May slow or reduce absorption of drugs.	Theoretical concern based on absorbent properties of marshmallow root.	**Take** at least 2 hours **away** from medication.

Herb	Drug	Potential Interaction	Basis of Concern	Recommended Action
Althaea officinalis **Meadowsweet** *Filipendula ulmaria* (See also Tannin-containing herbs)	**Warfarin**	May potentiate effects of drug.	Theoretical concern based on *in vivo* animal study demonstrating anticoagulant activity (details of dosage unavailable).239	**Monitor** (very low level of risk).
Peppermint *Mentha* x *piperita* (See also Tannin-containing herbs)	**Warfarin**	May inhibit effect of drug: decreased INR.	Two case reports (menthol cough drops: 8-10 per day;240 6 per day.)241 Assuming the cough drops contained 5-10 mg of menthol this is a dosage of about 30-100 mg/day of menthol.	**Monitor** (low level of risk at normal doses of herb).
PhellodendronC *Phellodendron amurense*	**Drugs that displace the protein binding of bilirubin** eg phenylbutazone	May potentiate effect of drug on displacing bilirubin.	**Herb Alone** Theoretical concern based on *in vitro* data (displaced biliruben from albumin) and in animals with high dose of berberine by injection (reduced bilirubin serum protein binding).3	**Monitor** (low level of risk).
Polyphenol-containingW or Flavonoid-containing herbs especially cayenne (*Capsicum annuum*), chamomile (*Matricaria chamomilla* (*Marticaria recutita*)), cocoa, green tea (*Camellia sinensis*), lime flowers (*Tilia*	**Immunosuppressives** eg cyclosporin	Decreases drug levels, due to impaired absorption or increased metabolism.	Three case reports, in transplant patients (2 L/day of herbal tea; 1-1.5 L/day of chamomile tea; ‘large quantities’ of fruit tea containing hibiscus extract and a drink containing black tea). Confirmed by rechallenge in one case, but no signs of rejection.242	**Monitor** (medium level of risk). Also advisable not to take simultaneously.

Herb	Drug	Potential Interaction	Basis of Concern	Recommended Action
cordata), rosemary (*Rosmarinus officinalis*), St Mary's Thistle (*Silybum marianum*), vervain (*Verbena officinalis*) (See also Tannin-containing herbs)				
Polyphenol-containingW or Flavonoid-containing herbs especially cayenne (*Capsicum annuum*), chamomile (*Matricaria chamomilla* (*Marticaria recutita*)), cocoa, green tea (*Camellia sinensis*), lime flowers (*Tilia cordata*), rosemary (*Rosmarinus officinalis*), St Mary's Thistle (*Silybum marianum*), vervain (*Verbena officinalis*) (See also Tannin-containing herbs)	**Iron**	Inhibition of non-haem ironX absorption.	Clinical study (included herb teas (German chamomile, vervain, lime flower, peppermint; all 3 g/300 mL), beverages (eg black tea, coffee, cocoa)): effect dependent on polyphenol content (per serving: 20-400 mg).243 *See also note* Y. Timing of intake may be important. *See also note* Z. Epidemiological study (United States): 1 cup/week of coffee associated with 1% lower serum ferritin in the elderly.244Epidemiological study (China): effect for eating chilli on serum ferritin in women not significant.245 Mixed results in other studies (healthy volunteers): rosemary (32.7 mg of polyphenols)246 and cayenne (high dose: 14.2 g, fresh weight,AA containing 25 mg polyphenols)247 caused inhibition; chamomile 248 and turmeric (2.8 g, fresh weight, containing 50 mg polyphenols)202 did not. *See also note* AB. Results for green tea have been conflicting: two studies found no effect (healthy volunteers and those with anaemia),249,250 two studies (healthy volunteers) found an effect.246,251	In anaemia and where iron supplementation is required, **do not take simultaneously** with meals or iron supplements.

Herb	Drug	Potential Interaction	Basis of Concern	Recommended Action
			Drinking green tea (1:100, 1 L/day) lowered serum ferritin in women with low levels of ferritin (< 25 mcg/L) at baseline. No effect in other women or men (vegetarians and omnivores), and no effect on iron status parameters.252Two epidemiological studies (French and Japanese populations) found mixed results for serum ferritin and haemoglobin, although risk of iron depletion or anaemia was not increased.253,254 Clinical study (150–300 mg/day EGCG): decreased absorption in healthy women with low iron stores administered together with iron. Results significant only at higher dosage.255 Concentrated extract of St Mary's Thistle reduced iron absorption in haemochromatosis patients.256	
Psyllium *Plantago ovata, Plantago psyllium, Plantago indica* (See also Hypoglycaemic herbs)	**Carbamazepine**	Decreases plasma drug level.	Clinical study (psyllium husk),257 although no adverse effect observed in one case report.258	**Take** at least 2 hours **away** from medication.
Psyllium *Plantago ovata, Plantago psyllium, Plantago indica*	**Digoxin**	May decrease absorption of drug.	Decreased bioavailability found for digoxin and 'crude' (undefined) dietary fibre,259 but no effect was found on digoxin levels in two clinical studies (psyllium husk).260,261 Slight decrease in absorption (15%) found in healthy volunteers when psyllium husk AC (15 g) and digoxin taken concomitantly but when given 30 minutes apart the decrease was much smaller (3%).262	**Take** at least 2 hours **away** from medication.

Herb	Drug	Potential Interaction	Basis of Concern	Recommended Action
(See also Hypoglycaemic herbs)				
Psyllium *Plantago ovata, Plantago psyllium, Plantago indica* (See also Hypoglycaemic herbs)	**Iron**	Inhibition of non-haem iron absorption.	**Iron from Test Meal** Clinical studies: absorption decreased by 8% (5 g/day for 2 meals, psyllium undefined) in healthy volunteers;263 no effect overall in type 2 diabetics, although significant differences among participants (14 g/day, for 6 weeks, psyllium undefined).264 **Iron from Diet** Clinical studies: no change in serum iron in two trials with patients (6 g/day, for 4-5 weeks, psyllium undefined;265 maximum tolerated dose, generally less than 25 g/day, for 4 months, psyllium husk);266 iron absorption decreased in non-anaemic adolescent girls, but iron balance was positive (25 g/day, for 3 weeks, psyllium husk);267 slight decrease in plasma iron in obese patients without effects on other iron parameters during first period of treatment (30 days), without further modification on long-term treatment of 6 months (6 g/day, psyllium undefined).268	In anaemia and where iron supplementation is required, **do not take simultaneously** with meals or iron supplements.
Psyllium *Plantago ovata, Plantago psyllium, Plantago indica* (See also Hypoglycaemic herbs)	**Lithium**	May decrease absorption of drug.	Case report (psyllium husk),269 and clinical study with healthy volunteers (psyllium husk).270 Hydrophilic psyllium may prevent lithium from ionising.	**Take** at least 2 hours **away** from medication.
Psyllium	**Prescribed medication**	May slow or reduce absorption of drugs.	Theoretical concern based on absorbent properties of	**Take** at least 2 hours **away** from

Herb	Drug	Potential Interaction	Basis of Concern	Recommended Action
Plantago ovata, Plantago psyllium, Plantago indica (See also Hypoglycaemic herbs)			psyllium. No effect found on absorption or prothrombin time in healthy volunteers when psyllium husk (14 g) and warfarin were taken concomitantly.271 Case report (adrenal crisis in stable patient with adrenal insufficiency; psyllium coadministered with steroid drugs).272 In a crossover trial, psyllium husk (6 g) was administered with orlistatAD three times a day and found to reduce the subsequent side effects. Single dose of psyllium (12 g) at bedtime was also effective in reducing the side effects.273	medication,AE except for orlistat which may be taken at the same time.
Psyllium *Plantago ovata, Plantago psyllium, Plantago indica* (See also Hypoglycaemic herbs)	**Thyroxine**	May decrease efficacy of drug.	Clinical study: decreased efficacy found in 12 hypothyroid patients consuming dietary fibre (one patient: whole grain cereal + psyllium laxative); some patients stabilised by decreasing or removing the fibre from their diet.274 Clinical study (healthy volunteers, 3.4 g/day, for 4 days, psyllium husk): decrease in absorption not significant.275	**Take** as many hours **apart** as possible. May require dose reduction or cessation of herb.
Saw Palmetto *Serenoa repens*	**Antiplatelet and anticoagulant drugs**	May potentiate effect of drug.	**Herb Alone** Case report (haemorrhage during surgery).276 Clinical trials: reduced intraoperative bleeding from transurethral resection of the prostate procedure with preoperative use of liposterolic extract (2 trials); blood loss not different when compared with drug treatment (1 trial).277	**Monitor** (very low level of risk).

Herb	Drug	Potential Interaction	Basis of Concern	Recommended Action
			Herb and Drug Case reports (2): increased INR (warfarin + simvastatin,278 aspirin + clopidogrel;279 – in the first case, the interaction may have been due to the vitamin E also present in the preparation;278 in the second case, six times the usual dose of extract was taken).	
Schisandra *Schisandra chinensis*	**Immunosuppressives**	May increase drug levels.	Sirolimus: Observations in some liver transplanted recipients. Clinical study: markedly increased drug levels in health volunteers280 given *S. sphenanthera* extract, providing 67.5 mg/day of deoxyschisandrinAF. Tacrolimus: Observations in some renal and liver transplanted recipients. Clinical studies: markedly increased drug levels in healthy volunteers 281 and transplant recipients,282,283 given *S. sphenanthera* extract, providing 67.5 mg/day of deoxyschisandrinAF.	**Monitor** (low level of risk at normal doses).
Schisandra *Schisandra chinensis*	**Midazolam**	May increase drug levels.	Increased drug level (defined as a moderate interactionE), increase in sleeping time and increase in mild to moderate adverse effects found in healthy volunteers, given *S. chinensis* extract, providing 22.5 mg/day of deoxyschisandrinAF.284	**Monitor** (medium level of risk at normal doses).
Schisandra *Schisandra chinensis*	**Prescribed medication**	May accelerate clearance from the body.	Theoretical concern based on *in vivo* animal studies demonstrating enhanced phase I/II hepatic metabolism.285,286	**Monitor** (medium level of risk).
Schisandra *Schisandra chinensis*	**Talinolol**	May increase drug levels.	Increased drug level and decreased clearance found in healthy volunteers, given *S. chinensis* extract, providing 33.75 mg/day of deoxyschisandrinAF.122	**Monitor** (low level of risk at normal doses).
Siberian Ginseng	**Digoxin**	May increase plasma drug levels.	Case report: apparent increase in plasma level, but herb probably interfered with digoxin assay AG (patient had	**Monitor** (very low level of risk).

Herb	Drug	Potential Interaction	Basis of Concern	Recommended Action
Eleutherococcus senticosus			unchanged ECG despite apparent digoxin concentration of 5.2 nmol/L).287 In a later clinical trial no effect observed on plasma concentration.288	
Slippery Elm Bark *Ulmus rubra*	**Prescribed medication**	May slow or reduce absorption of drugs.	Theoretical concern based on absorbent properties of slippery elm.	**Take** at least 2 hours **away** from medication.
St John's WortAH *Hypericum perforatum* (See also Tannin-containing herbs)	**Amitriptyline**	Decreases drug levels.289	Clinical study.	**Monitor** (medium level of risk).
St John's WortAH *Hypericum perforatum* (See also Tannin-containing herbs)	**Anticonvulsants** eg carbamazepine, mephenytoin, phenobarbitone, phenytoin	May decrease drug levels via CYP induction.290,291,292	Theoretical concern. An open clinical trial demonstrated no effect on carbamazepine pharmacokinetics in healthy volunteers.293 Case report: increase in seizures in patient taking several antiepileptic drugs, two of which are not metabolised by cytochrome P450.294 Clinical study (healthy volunteers; clinical significance unclear): increased excretion of a mephenytoin metabolite in extensive metabolizers, but not in poor metabolizers.295 *See note* AI.	**Monitor** (low level of risk).
St John's WortAH *Hypericum perforatum* (See also Tannin-containing	**Antihistamine** eg fexofenadine	Decreases drug levels.296,297	Clinical studies.	**Monitor** (medium level of risk).

Herb	Drug	Potential Interaction	Basis of Concern	Recommended Action
herbs)				
St John's WortAH *Hypericum perforatum* (See also Tannin-containing herbs)	**Antiplatelet and anticoagulant drugs**	Clopidogrel: May potentiate effects of drug.	Clinical studies: increased responsiveness (decreased platelet aggregation or improved residual platelet reactivity) in hyporesponsive volunteers and patients,298,299,300,301 possibly via the formation of the active metabolite (CYP3A4 activity was increased) thus providing a beneficial effect in these patients. This is a complex situation, with the meaning of clopidogrel resistance/hyporesponsiveness debated.298,302	In patients with known clopidogrel resistance: **Monitor** (medium level of risk). In other patients: **Monitor** (risk is unknown).
St John's WortAH *Hypericum perforatum* (See also Tannin-containing herbs)	**Antiplatelet and anticoagulant drugs (2)**	Phenprocoumon: Decreases plasma drug levels.	Clinical study.303	**Contraindicated.**
St John's WortAH *Hypericum perforatum* (See also Tannin-containing herbs)	**Antiplatelet and anticoagulant drugs (3)**	Warfarin: Decreases drug levels and INR.	Case reports (decreased INR (nine cases), increased INR (three cases)).304,305,306Clinical study with healthy volunteers (decreased drug level and INR).177	**Contraindicated.**
St John's WortAH *Hypericum perforatum*	**Benzodiazepines**	Decreases drug levels, and is probably dependent upon the hyperforin content.307	Alprazolam: Mixed results for drug levels in two clinical studies (similarly low amount of hyperforin, about 4 mg/day) – no effect (dried herb equivalent: 1.1 g/day)308 and decrease.309	**Monitor** (medium level of risk).

Herb	Drug	Potential Interaction	Basis of Concern	Recommended Action
(See also Tannin-containing herbs)				
St John's WortAH *Hypericum perforatum*	**Benzodiazepines (2)**	Decreases drug levels, and is probably dependent upon the hyperforin content.	Midazolam: Clinical studies, effect not regarded as clinically relevant for low (< 1 mg/day) hyperforin extracts.297,307,310,311	Hyperforin-rich extracts: **Monitor** (medium level of risk). Low-hyperforin extracts: **Monitor** (low level of risk).
(See also Tannin-containing herbs)				
St John's WortAH *Hypericum perforatum*	**Benzodiazepines (3)**	Decreases drug levels, and is probably dependent upon the hyperforin content.	Quazepam: Decreased drug levels, but no effect on pharmacodynamics (sedation).312	**Monitor** (low level of risk).
(See also Tannin-containing herbs)				
St John's WortAH *Hypericum perforatum*	**Calcium channel antagonists**	Decreases drug levels.	Nifedipine: Clinical studies.117,313 Verapamil: Clinical study.314	**Contraindicated.**
(See also Tannin-containing herbs)				
St John's WortAH *Hypericum perforatum*	**Cancer chemotherapeutic drugs** eg irinotecan, imatinib	Decreases drug levels.	Clinical studies.315,316,317,318	**Contraindicated.**

Herb	Drug	Potential Interaction	Basis of Concern	Recommended Action
(See also Tannin-containing herbs) **St John's Wort**AH *Hypericum perforatum*	**Clozapine**	Decreases drug levels.	Case report.319	**Contraindicated.**
(See also Tannin-containing herbs) **St John's Wort**AH *Hypericum perforatum*	**Digoxin**	Decreases drug levels.	Clinical studies (several studies showed decrease, one study showed no effect)308,320,321,322 but effect is dependent upon dose of herb and the hyperforin content.322	**Contraindicated** at doses equivalent to > 1 g/day dried herb, especially for high-hyperforin extracts.
(See also Tannin-containing herbs) **St John's Wort**AH *Hypericum perforatum*	**Docetaxel** (intravenous)	May decrease effectiveness of drug.	Clinical study with cancer patients:323 effect on pharmacokinetics probably not clinically relevant (e.g. plasma levels decreased by only 6%); drug-induced side effects were also reduced.	**Contraindicated**.
(See also Tannin-containing herbs) **St John's Wort**AH	**Finasteride**	May decrease drug levels.	Clinical study with healthy volunteers.324 Case report: PSA level elevated (due to decreased efficacy of drug?) in patient with benign prostatic hyperplasia.325	**Contraindicated.**

Herb	Drug	Potential Interaction	Basis of Concern	Recommended Action
Hypericum perforatum (See also Tannin-containing herbs)				
St John's WortAH *Hypericum perforatum* (See also Tannin-containing herbs)	**HIV non-nucleoside transcriptase inhibitors** eg nevirapine	Decreases drug levels.	Case report.326	**Contraindicated.**
St John's WortAH *Hypericum perforatum* (See also Tannin-containing herbs)	**HIV protease inhibitors** eg indinavir	Decreases drug levels.	Clinical study.327	**Contraindicated.**
St John's WortAH *Hypericum perforatum* (See also Tannin-containing herbs)	**Hypoglycaemic drugs**	Gliclazide: May reduce efficacy of drug by increased clearance.	Clinical study with healthy volunteers, but glucose and insulin response to glucose loading were unchanged.328	**Monitor** (low level of risk).

Herb	Drug	Potential Interaction	Basis of Concern	Recommended Action
St John's WortAH *Hypericum perforatum* (See also Tannin-containing herbs)	**Hypoglycaemic drugs (2)**	Repaglinide: May alter metabolism of drug.	Clinical study with healthy volunteers: no effect, and glucose and insulin response to glucose loading were unchanged.329	**Monitor** (very low level of risk).
St John's WortAH *Hypericum perforatum* (See also Tannin-containing herbs)	**Hypoglycaemic drugs (3)**	Tolbutamide: May affect blood glucose.	Two clinical studies (healthy volunteers): no effect on pharmacokinetics,308,310 but there was an increased incidence of hypoglycaemia in the trial using hyperforin-rich extract (33 mg/day).310	**Monitor** (low level of risk).
St John's WortAH *Hypericum perforatum* (See also Tannin-containing herbs)	**Immunosuppressives**	Decreases drug levels.	Cyclosporin: Case reports,330,331,332,333,334,335,336,337,338 case series,339,340 clinical studies.297,341 Interaction is dependent upon the hyperforin content.333,341 Tacrolimus: Case report and clinical studies.342,343,344	**Contraindicated** especially for high-hyperforin extracts.
St John's WortAH *Hypericum perforatum* (See also Tannin-containing herbs)	**Ivabradine**	May decrease drug levels.	Clinical trial with healthy volunteers. No pharmacodynamic effect was observed.345	**Monitor** (medium level of risk).

Herb	Drug	Potential Interaction	Basis of Concern	Recommended Action
St John's WortAH *Hypericum perforatum* (See also Tannin-containing herbs)	*S*-**Ketamine** (oral)	May decrease drug levels.	Clinical study with healthy volunteers. No pharmacodynamic effect was observed (eg analgesic effect not altered).346	**Monitor** (medium level of risk).
St John's WortAH *Hypericum perforatum* (See also Tannin-containing herbs)	**Methadone**	Decreases drug levels, possibly inducing withdrawal symptoms.	Case reports.347	**Contraindicated.**
St John's WortAH *Hypericum perforatum* (See also Tannin-containing herbs)	**Methylphenidate**	May decrease efficacy.	Case report,348 but clinical significance unclear.	**Monitor** (low level of risk).
St John's WortAH *Hypericum perforatum* (See also Tannin-containing herbs)	**Morphine** (oral)	May potentiate effects of drug.	Clinical study (healthy volunteers):349 pain scores were decreased when morphine co-administered with standardised extract at a dose of herb below those used to obtain an antidepressant or analgesic effect. The effect was dependent hypericin content, but not hyperforin. The authors suggest the herb may be able to decrease the dose of morphine while obtaining the same analgesic effect.	**Monitor** (medium level of risk).

Herb	Drug	Potential Interaction	Basis of Concern	Recommended Action
St John's WortAH *Hypericum perforatum* (See also Tannin-containing herbs)	**Omeprazole**	May decrease drug levels.	Clinical trial.350	**Monitor** (low level of risk).
St John's WortAH *Hypericum perforatum* (See also Tannin-containing herbs)	**Oral contraceptives**	May increase metabolism and reduce effectiveness of drug.	Breakthrough bleeding reported which was attributed to increased metabolism of drug.304,330,351 Clinical significance unclear. Cases of unwanted pregnancies have been reported.352,353 Contradictory results for effect on bioavailability, hormone levels and ovulation demonstrated in three clinical studies, although some breakthrough bleeding occurred.354,355,356 In one clinical trial an extract low in hyperforin did not affect plasma contraceptive drug levels or cause breakthrough bleeding.357 Clinical trial: clearance of levonorgestrel at emergency contraceptive doses increased (not statistically significant).358 Clinical study: antiandrogenic effect contraceptive not affected.359	Hyperforin-rich extracts: **Monitor** (medium level of risk). Low hyperforin extracts: **Monitor** (very low level of risk).
St John's WortAH *Hypericum perforatum* (See also Tannin-containing herbs)	**Oxycodone**	Decreases drug levels.	Clinical trial with healthy volunteers.360	**Monitor** (medium level of risk).
St John's WortAH	**SSRIs** eg paroxetine, trazodone,	Potentiation effects possible in regard to serotonin levels.	Case reports: clinical significance unclear.361,362,363,364,365,366	**Monitor** (very low level of risk).

Herb	Drug	Potential Interaction	Basis of Concern	Recommended Action
Hypericum perforatum (See also Tannin-containing herbs)	sertraline **and other serotonergic agents** eg nefazodone, venlafaxine			
St John's WortAH *Hypericum perforatum* (See also Tannin-containing herbs)	**Statin drugs**	May decrease effect and/or drug levels.	Atorvastatin: Clinical study, serum LDL-cholesterol increased by 0.32 mmol/L which corresponds to a decrease in effect of drug in patients by about 30%. Serum total cholesterol was also increased.367 Pravastatin: Clinical study, no effect on plasma level in healthy volunteers.368 Rosuvastatin: Case report.369 Simvastatin: Two clinical studies, decrease in drug levels in healthy volunteers,368 and small increases in serum total cholesterol and LDL-cholesterol in patients.370	**Monitor** blood cholesterol regularly (medium level of risk).
St John's WortAH *Hypericum perforatum* (See also Tannin-containing herbs)	**Talinolol**	May decrease drug levels.	Clinical study with healthy volunteers.371	**Monitor** (medium level of risk).
St John's WortAH *Hypericum perforatum*	**Theophylline**	May decrease drug levels.	Case report.372 No effect observed in clinical study.373	**Monitor** (low level of risk).

Herb	Drug	Potential Interaction	Basis of Concern	Recommended Action
(See also Tannin-containing herbs)				
St John's WortAH *Hypericum perforatum*	**Voriconazole**	Decreases drug levels.	Clinical study.374	**Monitor** (medium level of risk).
(See also Tannin-containing herbs)				
St John's WortAH *Hypericum perforatum*	**Zolpidem**	May decrease drug levels (but with wide interindividual variability).AJ	Clinical study (healthy volunteers).375	**Monitor** (low level of risk).
(See also Tannin-containing herbs)				
St Mary's ThistleJ *Silybum marianum* (See also Polyphenol-containing herbs)	**Hypoglycaemic drugs** including insulin	May improve insulin sensitivity.	Controlled trials: improved glycaemic control and reduced insulin requirements in patients with type 2 diabetes and cirrhosis (silymarin: 600 mg/day),376 although insulin requirements unchanged in another trial (silymarin: 200 mg/day);377 improved glycaemic control in diabetics treated with hypoglycaemic drugs (silymarin: 200 and 600 mg/day),378,379 improved blood glucose, blood insulin and insulin resistance in PCOS patients treated with metformin (silymarin: 750 mg/day);380 but no effect on glucose metabolism in NAFLD patients including those with insulin resistance (silymarin: 280 and 600 mg/day).381,382	Prescribe cautiously and monitor blood sugar regularly. **Warn** patient about possible hypoglycaemic effects. **Reduce** drug if necessary in conjunction with prescribing physician.

Herb	Drug	Potential Interaction	Basis of Concern	Recommended Action
St Mary's Thistle[J] *Silybum marianum* (See also Polyphenol-containing herbs)	**Immunosuppressives** eg sirolimus	May decrease drug clearance.	Population pharmacokinetic study with 112 Chinese adult renal transplant recipients: clearance of sirolimus decreased in those patients with abnormal ALT values who were taking silymarin formulations (route and dosage unknown).[236]	**Monitor** (medium level of risk) in hepatically-impaired patients.
St Mary's Thistle[J] *Silybum marianum* (See also Polyphenol-containing herbs)	**Losartan**	May reduce efficacy of drug by inhibiting metabolism.	Clinical study (healthy volunteers; clinical significance unclear): inhibited metabolism of drug; the inhibition was greater in those of a particular CYP2C9 genotype (silymarin: 420 mg/day).[383] *See note* AK.	**Monitor** (low level of risk).
St Mary's Thistle[J] *Silybum marianum* (See also Polyphenol-containing herbs)	**Metronidazole**	May decrease absorption of drug, by increasing clearance.	Clinical study with healthy volunteers (silymarin: 140 mg/day).[384]	**Monitor** (medium level of risk).
St Mary's Thistle[J] *Silybum marianum* (See also Polyphenol-containing herbs)	**Nifedipine**	May delay the absorption rate of drug.	Clinical study with healthy volunteers (silymarin: 280 mg/day), but bioavailability unchanged.[385]	**Monitor** (low level of risk).

Herb	Drug	Potential Interaction	Basis of Concern	Recommended Action
St Mary's ThistleJ *Silybum marianum* (See also Polyphenol-containing herbs)	**Ornidazole**	May increase drug levels.	Clinical study with healthy volunteers (silymarin: 140 mg/day).386	**Monitor** (medium level of risk).
St Mary's ThistleJ *Silybum marianum* (See also Polyphenol-containing herbs)	**Talinolol**	May increase drug levels.	Clinical study with healthy volunteers (silymarin: 420 mg/day).387	**Monitor** (low level of risk).
Tannin-containing or OPC-containing herbs eg agrimony (*Agrimonia eupatoria*), bearberry (*Arctostaphylos uva-ursi*), grape seed extract (*Vitis vinifera*), green tea (*Camellia sinensis*), hawthorn (*Crataegus* spp.), lemon balm (*Melissa officinalis*), meadowsweet (*Filipendula ulmaria*), peppermint (*Mentha* x *piperita*), Pelargonium (*Pelargonium sidoides*), pine bark (*Pinus massoniana*), raspberry leaf (*Rubus idaeus*), sage (*Salvia*	**Minerals** especially iron	Iron: May reduce absorption of non-haem ironX from food.	Clinical studies in healthy volunteers, administration during or immediately following the meal243,388,389,390,391,392,393,394,395 (black tea, typical strength: 0.8–3.3 g/100 mL;243,388,389,390,391,392,394 sorghumAL (0.15% tannins),393 and in women with iron deficiency anaemia396 (black tea: 1–2 x 150 mL of 1:100 infusion containing 78 mg of tannins per 150 mL).396 Iron absorption reduced to a greater extent in those with iron deficiency anemia (IDA).396 However, the results from single test meals may exaggerate the effect of iron inhibitors and enhancers.397 Effects were not significant in a 14-day study.251 Cases of IDA resistant to treatment: heavy black tea drinkers (2 cases, 1.5–2 L/day).398,399	**Take** at least 2 hours **away** from food or medication.

Herb	Drug	Potential Interaction	Basis of Concern	Recommended Action
fruticosa), St John's Wort (*Hypericum perforatum*), willow bark (*Salix* spp.), *willow herb* (*Epilobium parviflorum*) (See also Polyphenol-containing herbs)			Epidemiological studies (12, to 2002) found mixed results, but some evidence of an association between drinking black tea and poor iron status.397 Clinical study in patients with haemochromatosis (black tea: 250 mL with meal).400	
Tannin-containing or OPC-containing herbs eg agrimony (*Agrimonia eupatoria*), bearberry (*Arctostaphylos uva-ursi*), grape seed extract (*Vitis vinifera*), green tea (*Camellia sinensis*), hawthorn (*Crataegus* spp.), lemon balm (*Melissa officinalis*), meadowsweet (*Filipendula ulmaria*), peppermint (*Mentha* x *piperita*), Pelargonium (*Pelargonium sidoides*), pine bark (*Pinus massoniana*), raspberry leaf (*Rubus idaeus*), sage (*Salvia fruticosa*), St John's Wort (*Hypericum perforatum*), willow bark (*Salix* spp.), *willow herb* (*Epilobium parviflorum*)	**Minerals (2)** especially iron	Zinc: May reduce absorption from food.	Clinical studies with healthy volunteers: results conflicting for effect on zinc (undefined tea,401 black tea251 consumed at or immediately after food).	**Take** at least 2 hours **away** from food or medication.

Herb	Drug	Potential Interaction	Basis of Concern	Recommended Action
(See also Polyphenol-containing herbs)				
TurmericC *Curcuma longa*	**Talinolol**	May decrease drug levels.	Clinical study with healthy volunteers (300 mg/day of curcuminoids).402	**Monitor** at high doses (≥ 300 mg/day curcumin, low level of risk).
Valerians Mexican Valerian (*Valeriana edulis*), Valerian (*Valeriana officinalis*)	**CNS depressants or alcohol**	May potentiate effects of drug.	Theoretical concern expressed by US Pharmacopeial Convention.403 However a clinical study found no potentiation with alcohol.404 Case report of adverse effect with benzodiazepine drug (lorazepam)405 – herb dosage undefined but likely high (tablet contained valerian and passionflower (*Passiflora incarnata*)). Alprazolam: Clinical study in healthy volunteers found no effect on drug levels (extract provided 11 mg/day total valerenic acids).406	**Monitor** (very low level of risk).
Willow Bark *Salix alba, Salix daphnoides, Salix purpurea, Salix fragilis* (See also Tannin-containing herbs)	**Warfarin**	May potentiate effects of drug.	**Herb Alone** Clinical study observed very mild but statistically significant antiplatelet activity (extract containing 240 mg/day of salicin).407	**Monitor** (low level of risk).