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Herbal Support for Traumatic Brain Injury

General recommendations and specific strategies

•Strategy: Help reduce short- and long-term impacts of inflammation on brain tissue.

Plant *flavonoids*, such as anthocyanidins from blueberry (*Vaccinium macrocarpon*), reduce inflammationⁱ and vasodilationⁱⁱ helping with swelling and edema. ¼ to ½ cup frozen blueberries daily. They are also neuroprotectiveⁱⁱⁱ, acting through various intracellular pathways to reduce neuronal damage, death, and dysfunction.

Glycosylated flavonoids, such as the ginkgo (*G. biloba*) flavo-glycosides, directly reduce edema in brain tissue^{iv v}, improve circulation, and can affect mood (see below). 240mg to 480mg of standardized (24% flavo-glycosides) extract daily.

Curcumin, from Turmeric (*Curcuma longa*), has a long history of use as a systemic anti-inflammatory, and has received recent attention for treating central nervous system injury and inflammation^{vi}, and specifically for subarachnoid hemorrhage^{vii} and traumatic brain injury^{viii}.

Boswellia, a resin commonly known as Frankincense, has numerous clinical trials that substantiate its use as a general anti-inflammatory. Recent pharmacological evidence points to its ability to enter neuronal tissue in the central nervous system and provide anti-inflammatory effects there^{ix}. It should be taken as part of a meal containing fats for best effect^x.

Specific *essential fatty acids*, such as the omega-3 EFA's from flax (*Linum usitatissimum*) seed known as DHA (docosahexanoic acid) serve not only as building blocks for neuronal membranes, but also participate in down-regulating proinflammatory signals in brain tissue^{xi}. 3-5 TBS ground seeds daily, or 2,000mg to 4,000mg daily of oil.

While concentrated forms of these nutrients can be obtained from herbs or herbal extracts, they are largely available through the diet as well.

•Strategy: Provide essential neuron-specific metabolites for the regrowth of brain tissue and optimal neuronal function.

Oats (*Avena sativa*) are used as a traditional medicine when prepared from the unripe tops of the plant, either as an extract or as an infusion. Oats are rich in calmodulin^{xii} and phosphatidylinositol^{xiii}. Traditionally used to improve nerve function following injury or pathological degradation; this occurs perhaps through stimulation of potassium channel expression and function. An infusion is taken at the rate of 1 quart daily, steeped overnight with 5-6 tablespoons of oat tops.

Botanicals with neuronal anti-inflammatory effects have also been shown in animal models to increase rates of regeneration in damaged retinal ganglion cells in the eye^{xiv}. We see the use of Ginkgo again, combined with American Ginseng (*Panax quinquefolium*) and St. John's Wort (*Hypericum perforatum*).

•**Strategy: Manage peripheral symptoms (tremor, palsy, neuropathy).** Mullein (*Verbascum thapsus*) has been used as a piscicide^{xv}, with a somewhat analgesic effect in humans. It also has a history of traditional use for symptoms of palsy. Valerian (*Valeriana officinalis*) has therapeutic potential as an anticonvulsant, again echoed in the historical record^{xvi}. Extract of both, at doses from 3ml to 5ml three to five times daily, are taken in water. Huperzia (*H. serrata*) has nootropic^{xvii} and neuroprotective^{xviii xix} effects taken as an extract that provides a daily dose of 200µg to 400µg of the alkaloid *huperzine* daily. Huperzia, also much researched as a treatment for Alzheimer's disease^{xx}, seems to potentiate the effects of acetylcholine, a central neurotransmitter involved in attention, alertness, focus and memory.

External applications of the infused oil of St. Johnswort (*Hypericum perforatum*) to areas with neuropathy if necessary. Also, capsaicin from chili peppers (*Piper frutescens*) has received ample evidence^{xxi} of effectiveness in treating neuropathy, probably through desensitization of vanilloid pain receptors^{xxii}.

•**Strategy: Using caution in cases with hemorrhage, ensure optimal circulation to the brain to reduce inflammation and promote regeneration.** Herbs such as hawthorn (*Crataegus spp.*), rosemary (*Rosmarinus officinalis*), linden (*Tilia spp.*), or ginger (*Zingiber officinale*) are chosen and blended into tonic teas depending on the entire symptom profile of the individual. Rosemary^{xxiii} and ginger^{xxiv} are strongly anti-inflammatory and reduce neuronal injury secondary to inflammation.

•**Strategy: Manage associated neuropsychiatric symptoms.** Episodes of depression, mania, anxiety, memory loss, cognitive dysfunction and insomnia can be associated with the recovery from TBI. Specific botanicals can be selected to help with these symptoms.

Depression is ameliorated by the circulatory stimulants listed above, and by Rhodiola (*R. rosea*) which helps buffer the effects of stress, protect the cardiovascular system, and re-awaken the central nervous system^{xxv} primarily through its effects on catecholamine neurotransmitters^{xxvi}. Doses of 3ml of the liquid extract once or twice a day are good to start. St. Johnswort is also useful, at doses of 300mg to 900mg daily, and especially in cases of a cold, depleted constitution. Recent meta-analyses come down in favor of its antidepressant effects in moderate depression, and underline its safety^{xxvii}. However, see cautions below.

Mania can be buffered somewhat using the nervine tonics such as scullcap (*Scutellaria lateriflora*) and lemon balm (*Melissa officinalis*), although research on these botanical medicines is just beginning. Anticonvulsants as described above can also be useful.

Anxious conditions benefit from ginkgo^{xxviii}, kava-kava (*Piper methysticum*)^{xxix}, and the nervine tonics described above. Kava-kava liquid extract can be taken at doses ranging from 1ml to 3ml one to five times a day.

There is considerable human research accumulating that highlights bacopa (*Bacopa monnieri* / *monniera*). Recent studies, underlying this herb's safety^{xxx}, show that it improves attention to task, memory consolidation, and information processing skills^{xxxi,xxxii}. The improvement in memory and an associated reduction in anxiety are evident at all ages^{xxxiii,xxxiv}. Dosages of bacopa extract are usually 300mg twice daily of preparations standardized to 20% bacosides, or about 2-3 ml of a liquid extract.

Insomnia can benefit from valerian root extract, but the powder or extract of ashwagandha (*Withania somnifera*), when coupled with relaxation techniques, is quite restorative and effective for insomnia^{xxxv}. Ashwagandha also helps with central-nervous system cognitive symptoms^{xxxvi} making it a good choice following TBI if the mentioned symptoms are present.

•**Other considerations:** Adequate rest and optimal nutrition are essential components to adequate recovery. Additionally, techniques such as meditation and visualization can be helpful as long as they are a part of an ongoing, focused program. Simple rituals such as the brewing of a cup of tea can serve as anchors during a tumultuous time; walks in gardens and woods soothe the mind and refresh the body. Adequate exercise is also essential, both physical and mental, and should be dovetailed to any rehabilitation program.

•**Cautions:** A thorough history will reveal any hemorrhagic progression the client may have experienced / be experiencing. In these cases, caution is advised in the use of circulatory enhancers, although the NO-inhibiting and vasoconstrictive effects of compounds such as berry anthocyanidins should be encouraged. A complete history of medications, both past and present, is also essential to avoid the potential of herb/drug interactions, especially between conventional anticonvulsant, antidepressant, and anti-inflammatory medications and herbs such as St. Johnswort^{xxxvii}. Consult a qualified herbalist.

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