

Herbs for Wound Healing and Infection Control – Sam Coffman

Goals of phytotherapeutic approaches to wound healing and infection management (both as singular as well as integrative or adjuvant care):

- Reducing tissue inflammation
- Increasing tissue proliferation
- Cleaning and managing infected tissue
- Managing chronic (non-healing) wounds
- Managing antibiotic-resistant bacterial infections

Four stages of wound healing:

- Hemostasis
- Inflammation
- Proliferation
- Remodeling

Infection most common during inflammation and proliferation stages

Recognizing the differences between inflammation and infection:

	Inflammation	Infection
Swelling	Swelling present, generally uniform around wound area	Swelling present, not necessarily uniform (circumferentially in the case of an extremity) around wound area but may be more swollen directly around infected area
Color	Can be normal skin color, pale or slightly red. Usually uniform and once it has reached a certain size, does not continue to grow or spread.	Generally red to bright red. Often wounds will have a brighter reddish hue to them along the edge of the wound where there is minor infection present, vs. more normal or pale skin color of inflammation that exists from the wound edge. In the case of deeper wound infections, the red can be a bright, glossy or waxy sheen. A patch of color that grows (regardless of the hue), is also generally a sign of infection vs. inflammation.

		<p>Drawing a boundary around the area of color with a marker is one way to determine if the color (and swelling) is spreading.</p> <p>Streaks of red traveling toward the heart (infection that is becoming systemic and spreading via lymph) is another specific, later (and dangerous) sign of infection.</p>
Tenderness	Tender to the touch, but usually more of a general tenderness across the entire wound area.	Specific pain that is generally sharper, directly on and around the infected area – especially when pressed or touched even lightly. In the case of deeper wound infection that may not be as visible on the surface, if the area has been rested and then starts to move (such as a leg wound that has been elevated), the pain can be specific, sharp and severe at first upon movement, lessening after some continued movement.
Heat	General heat around the injury, usually low grade	Increasing heat around the wound area. May start out as low grade and then become high grade.
Exudate (pus)	No exudate	Exudate present. Wound will usually begin to drain if it can (and should be allowed to).
Systemic	Usually no systemic signs (other than from pain-related)	Fever, chills, nausea, malaise, flu-like symptoms (generally appearing later stage in an infection, and a sign that the infection is critical).

Herbal Approaches:

1) Wound cleaning

- a. **Irrigation** (ASIF – Amount of blood loss, Shock, Irrigation, Further/Functional damage)
- b. **Activated Charcoal**
 - i. Plaster – contact between dirty tissue and charcoal is paramount
 - ii. Non-polar binding
- c. ***Opuntia spp.* (Prickly Pear Cactus)**
 - i. Flocculant
 - ii. Hydrophilic
 - iii. Antioxidant
 - iv. Anticlastogenic
- d. ***Plantago spp.* (Plantain)**
 - i. Drawing/Pulling
 - ii. Baicalin
- e. ***Verbascum thapsus* (Mullein leaf)**
 - i. Drawing/Pulling
- f. ***Echinacea angustifolia* and/or *pallida* root**
 - i. Particularly for envenomated wounds

2) Infection management

- a. **MRSA, Staph → 5'methoxyhydnocarpin (MHC)**
 - i. Berberine-containing herbs, often more in the leaf than root
 - 1. *Berberis spp.* (*trifoliolata*, *aquifolium*, *vulgaris*, *fremonii*, etc.)
 - 2. *Hydrastis canadensis* (Goldenseal)
 - 3. *Coptis chinensis* (Chinese Goldthread)
 - ii. *Capsicum anuum*
 - iii. Efflux pump inhibition (NorA)
- b. **Biofilms**
 - i. Structure and purpose vs. planktonic form of bacteria
 - ii. Quorum sensing and inhibition (QSI)
 - iii. Baicalin
 - 1. *Plantago spp.*
 - 2. *Scutellaria baicalensis*
- c. **Directly antibacterial herbs**
 - i. *Usnea spp.*
 - ii. *Commiphora spp.*
 - iii. *Larrea spp.*
 - iv. *Allium spp.*
 - v. *Anemopsis californica*
- d. **Indirectly antibacterial herbs**

- i. *Echinacea spp.*
- ii. *Phytolacca americana*
- iii. *Ceanothus spp.*
- iv. *Lantana camara & urticoides*

e. External applications

- i. Direct contact (plaster, packing)
- ii. Infusion (poultice)

f. Tissue perfusion and angiogenesis, Nitric Oxide (NO), Endothelial Nitric Oxide Synthase (eNOS) and Vascular Endothelial Growth Factor (VEGF), angiogenesis,

- i. *Centella asiatica* (angiogenesis)
- ii. *Prunella vulgaris* (NO/eNOS balance)
- iii. *Astragalus membranaceous* (NO/eNOS balance)
- iv. *Larrea spp.*
- v. *Lantana camara & urticoides*
- vi. *Angelica sinensis* (VEGF)

g. Other internal strategies

- i. Lymph & immune
- ii. Liver (metabolism, elimination)
- iii. Kidney, urinary tract (elimination)
- iv. Nutrition (necessity of collagen)
- v. Sleep