

## The Biological Basis of Wound Care in the Horse

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Many horse owners are at one time or another met with a wound requiring some degree of attention. There are many theories on wound care, however after many years involvement with both human and horse wound management, I believe the basic premise must be to reduce the risk of infection, encourage the growth of healthy tissue, minimise scarring and promote a return to full function.

So what does the body do in response to injury?

### *Superficial Wounds:*

Here the skin cells enlarge and move across the wound until they come in contact with another skin cell, they then change direction until another cell is touched, and so on until the cell is surrounded by cells. At the same time other cells are dividing to replace those that have moved. This migration and division continues until the wound is resurfaced. The relocated cells then divide to thicken the new area of skin.

This whole process takes only 24 - 48 hours without the presence of infection and interruption.

### *Deep Wound Healing:*

Here the process becomes a little more involved, and in most cases there is some scar formation.

The body's first response to a deep injury is inflammation. This influx of fluid and blood, aids to clean the wound removing both bacteria and foreign material, it provides white blood cells to arrest the entry of bacteria and to aid the formation of scar tissue. This prepares the injured tissue for repair. A blood clot then forms to unite the wound edges. Skin cells then migrate under the clot to join the edges of the wound, collagen fibres begin to be laid down in a random fashion, and there is an increase in blood vessels. This helps to fill the wound with an actively growing tissue called granulation tissue. Granulation tissue secretes a fluid that kills bacteria, and is vital to support the incoming cells. Both skin cells and small blood vessels now show prolific growth to fill the area. From here the healing process enters the maturation phase when any scab will slough off, the randomly laid fibres are reorganised, the skin resumes its normal thickness and the blood vessels are restored to normal.

The major conditions affecting repair are nutrition, blood circulation, age, and wound management.

Lets look at these individually:

### *Nutrition:*

Efficient healing requires a high level of protein, vitamins and other nutrients from bodily stores. Protein is a major component of all cells, thus it is vital for the cell production during wound healing. Vitamin A is required for replacement of skin cells, Vitamin B for cell division and for in pain relief, Vitamin C aids in production of collagen and in the formation and strengthening of new blood vessels. Vitamin E promotes healing of injured tissue and Vitamin K is important in the production of proteins and blood clotting. You can provide these requirements with a balanced diet and supplemental herbs.

### *Blood Circulation:*

Blood brings healing agents such as oxygen and antibacterial cells to the wound, and removes excess fluid, bacteria and foreign bodies thus enhancing healing.

*Age:*

As the horse ages the rate of cell division and nutrient synthesis slows. Thus the older horse requires more support in healing and has an increased likelihood of scarring.

*Wound Management:*

Rule Number One: Encourage and care for the fragile granulation tissue: How often have you heard people say "the vet told me to leave the wound wrapped for 7 days, I'm not doing that, vets do not know anything about wound care" lets think again. Ensuring a wound is clean, covering it with a healing agent and wrapping the wound up to allow the body to do the rest is the best advice anyone can give you. The more you fiddle with the wound or pick off hard scabs, the more you put on agents that excite the wound tissues and/or encourage the formation of scabs, the more likely you are to encourage the formation of proud flesh or over granulation.

Why does this happen? Every time you disturb the surface of the healing tissue you remove some of the newly laid down collagen fibres and skin cells and so healing has to start again. Eventually there is an over production of granulation tissue. We all know how easily a horse forms proud flesh so why encourage it?

Juliette de Bairacli Levy (1991) writes that a "famed gypsy remedy was to first...stem the bleeding...The open area is then sprinkled with black pepper, which acts as a powerful disinfectant and also stimulates healing. The wound is then sewn up and left to heal naturally". We use different healing agents but the premise is the same, give some assistance but then let the body do its job.