



# Pet News

Psychotropics Animal Health Division Publication



# pil

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## From the Editor's Desk.....

Dear Readers,

Hope this New Year brings a lot of happiness and prosperity to all of you.

Last year, Animal Healthcare by PIL brought to you a lot of informative material on canine health issues, such as periodontal diseases and their management, ear hygiene in dogs, hip dysplasia and simple physiotherapy exercises, treatment of obesity and diet management in obese dogs.

In continuation to our efforts to support the veterinarian community, we will continue to provide you with informative articles this year as well. In this edition, we bring to you unique therapies for management of difficult wounds. We hope you will benefit from this article.

In case any topic interests you and you would like us to write on it, please send in your comments to me at [geetrao@pilindia.in](mailto:geetrao@pilindia.in). We will be happy to write on a topic of your choice.

Regards  
**Geetika Rao**  
Business Development Executive  
Animal Healthcare Division  
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## Difficult Wounds – Unique Therapies

Small Animal Practitioners commonly encounter traumatic wounds. Despite the advances in medical science and the availability of antibiotics, age and underlying illness may challenge the treatment. Hence, Animal Healthcare by PIL shares with you, unique therapies for those difficult wounds such as use of sugar, vinegar etc. Although, mankind has used these remedies over centuries, PIL brings to you the science behind and the correct application of these therapies. Please note that all the therapies mentioned in this edition are for full thickness wounds without granulation tissue or those with superficial infections.

### Table 1: Wound Preparation Before Topical Treatment

- After initial assessment, stabilize animal
- Control bleeding through pressure
- A pneumatic cuff should be used instead of tourniquet as cuffs reduce chances of neurovascular complications associated with use of narrow tourniquets
- Oral anti-biotic therapy should be initiated in all cases of dirty, infected wounds
- Protect wound with water soluble sterile lubricant
- Clip and clean surrounding skin
- Lavage the wound under 7 to 8 psi of pressure with sterile 0.9% saline or buffered sterile solution that is isotonic
- A 35 or 60 ml syringe and 18-gauge needle provides enough pressure for difficult to access areas/ pockets
- Dry the area around the wound with sterile gauze
- Depending upon therapy, wound bed may also need to be dried. However, care must be taken not to disturb the newly granulated tissue or delicate epithelial tissue

### In this Edition

- Editor's Message
- Difficult Wounds – Unique Therapies
- Indications for Specific Wound Therapies
- Wound Therapies – Mechanism & Application



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## Sugar

Sugar has high osmolality, which draws water out of the wound thus inhibiting growth of bacteria in the wound. High osmolality of sugar also interrupts cell signaling of bacteria and cell wall permeability, leading to bacterial death. Sugar also attracts the white blood cells called macrophages and forms a protective layer of protein by sloughing and shedding of devitalized tissue, hence allowing the formation of granulation tissue. This protein layer is created from inflammatory cells and sloughing dead cells.

**1. Lavage and Debridement:** Lavage the wound as given in Table 1. Due to sugar's debriding properties, grossly contaminated wounds may not need superficial debridement. The wound shown in the figures 1 to 7 receives 1 liter of lavage at initial cleaning and about 500 to 1000 ml of lavage at each bandage change.

**2. Application:** A thick layer of sugar (at least 1-2 cm thick) should be applied to the entire wound, including undermined areas. It is important that the entire wound remains filled with sugar to maintain high osmolality of the wound to kill the bacteria.

**3. Bandage Change:** Bandage should be changed once or twice daily or as needed, eg. whenever strike-through is seen on bandage, or sugar is dissolved. During the bandage change, the wound should be well lavaged with saline/ tap water. Bandage should be changed at least twice a day for large infected wounds.

## Indications for Specific Wound Therapies

Wound Therapy	Indications
Granulated Sugar	<ul style="list-style-type: none"> <li>• Pseudomonas or gross infection in full thickness wounds</li> <li>• Large, highly exudative contaminated wounds that need cleaning and debridement</li> </ul>
Honey	<ul style="list-style-type: none"> <li>• Partial thickness wounds, Infected wounds</li> <li>• Wounds needing increased granulation and epithelialization</li> </ul>
Vinegar (acetic acid)	<ul style="list-style-type: none"> <li>• Small, full thickness wounds infected with P aeruginosa and Staphylococcus aureus</li> <li>• Moderate, partial thickness wounds infected with S aureus and P aeruginosa</li> </ul>
Diluted Sodium Hypochlorite solution 0.5% (Dakin's Solution)	<ul style="list-style-type: none"> <li>• Wounds infected with bacteria &amp; fungi</li> <li>• Wounds that need additional granulation</li> <li>• Sensitive, painful wounds (the solution is non irritating at 0.5% or lower concentrations)</li> </ul>

Severely infected wounds may take 5 days to become "clean". Frequency of bandaging can be reduced as granulation tissue forms.

**4. Length of Treatment:** Continue treatment with sugar until pockets and undermined tissue are closed and debridement is complete or until granulation bed is formed. Once granulation bed appears, infections are less likely and non-adherent primary bandage can be used.

**5. Precaution:** Sugar draws large amount of water from the wound; hence patient's hydration and hemodynamic status must be monitored and treated. Sugar dressings require frequent changing due to their exudative nature and also because sugar loses its osmotic pull once it starts dissolving.



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1  
Initial presentation of a degloving and crushing injury of the dorsal metatarsus infected with *Pseudomonas*



2  
After cleaning the wound, a thick layer of granulated sugar was poured over the entire wound



3  
Large sterile cotton gauze was used to hold the sugar on the distal wound



4  
The wound was wrapped to ensure the sugar stayed in place and covered the entire wound. The primary layer must be sterile and very absorbent



5  
The secondary layer should bulk the bandage to prevent stikethrough. An aluminium rod was incorporated in this layer to support the hock, which was unstable



6  
A tertiary layer was applied to hold and protect the bandage. This layer must not be too tight



7  
Preoperative picture of the metatarsal injury illustrating granulation, epithelialization, and lack of infection. This wound was successfully closed with a mesh graft

## Honey

Egyptians used honey for topical treatment for over 4000 years. Honey has antibacterial activity due to its high osmolality, acidity and peroxide activity. Honey contains hydrogenperoxide, which is released slowly, killing the germs. It enhances granulation as well as epithelialization of wounds. High osmolality draws fluid and lymph from underlying tissues, providing nourishment to wound. Honey's pH (3.6 – 3.7) creates desired acidic environment, which decreases bacteria and increases fibroblast activity.

**1. Lavage and Debridement:** See Table 1.

**2. Application:** Pre soak gauze in honey instead of pouring honey directly onto the wound. Honey does not interfere with

bandage absorbency, hence wound exudate will stay contained within the bandage. However, a secondary absorbent dressing should be put to prevent oozing of honey from primary layer.

**3. Bandage Change:** Frequency of bandage changes depends on how rapidly honey is diluted by wound exudate or if stikethrough occurs.

**4. Precaution:** Honey may cause discomfort when applied to full thickness wounds. Honey used for wound healing must be unpasteurized. Makuna honey is considered to be the best option for wound healing.

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## Vinegar

Vinegar is a dilute solution of acetic acid. Vinegar was used in World War I for healing wounds. Non-toxic concentrations (<0.0025%) are slightly effective against gram positive and gram negative bacteria. At this concentration, vinegar has no detrimental effects on fibroblasts and keratinocytes.

**1. Lavage and Debridement:** See wound preparation

**2. Application:** Apply vinegar directly onto the wound or soak the primary bandage layer before application.

## Dankin's Solution

Dankin solution or Sodium Hypochlorite solution is called so after the English chemist, Henry Dysdale Dakin, who developed it. Stronger germicidal solutions like iodine lose their potency in presence of blood or may even damage living cells. Dakin's solution is a solution of diluted bleach treated to reduce irritation. Chlorine in Dakin's solution is a strong antiseptic that kills most forms of bacteria and virus.

**1. Lavage and Debridement:** See wound preparation

**2. Application:** Same as Vinegar

**3. Bandaging:** Same as Vinegar

**4. Disadvantages:** Like Vinegar, Dankin's solution has limited spectrum of efficacy.

## Making Dankin's Solution (0.5%)

The ingredients required to make Dakin's solution include tap water, baking soda, and household bleach.

1. Boil 4 cups or 32 ounces of tap water in a clean pan (with the lid on) for 15 minutes.
2. Remove the pan from heat
3. Using a sterile measuring spoon, add 1/2 teaspoon of baking soda and 3 ounces or 95 ml of bleach.
4. Place the solution in a sterile jar, close the lid tightly, and cover the entire jar in aluminum foil to protect it from light. Throw away any unused portion 48 hours after opening. unopened jars can be stored at room temperature for 1 month after preparation.

**3. Bandaging:** Upon applying vinegar to the wound or securing a primary layer soaked in vinegar on the wound, place a secondary layer to create a wet-to-dry bandage where acetic acid acts as a topical anti-bacterial.

**4. Disadvantages:** Vinegar is not effective against E coli, Bacteroides fragilis and Enterococcus. Diluted vinegar (2% acetic acid) is effective for treating ear infections, however, low pH may irritate inflamed skin.

## ? DID YOU KNOW

- Honey has gained so much popularity for wound management in the west that many companies now manufacture readymade dressings impregnated with active medical grade honey for application on wounds
- Inspired by remedies adopted in World War II, doctors in AIIMS started using honey for chronic wounds in 2010 and published in Indian Journal of Surgery that it provided better results than betadine. Honey collected from beehives on neem trees was supplied by Baba Ram Dev's Patanjali Yogpeeth Ashram (indiatoday.in)
- Studies have shown that old wives' tales that wounds should be exposed to air are incorrect. Wounds should be given a moist environment so that platelets can be build the scaffolding and white blood cells, fibroblasts and epithelial cells can migrate through the wound. Leaving a wound open dries it and cells cannot do their job well.

Source:  
• The Merck Veterinary Manual, • Today's Veterinary Practice

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