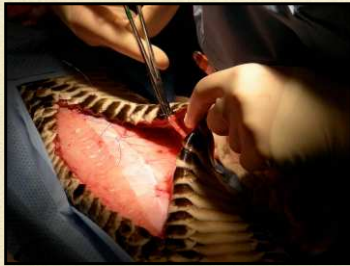


# WOUND MANAGEMENT

What do I do with this?

Barbro Nordquist, DVM  
Puget Sound Veterinary Referral Center

## Classification



## Esmarch's Principles

- Do not introduce anything harmful
- Allow tissues to rest
- Wound drainage
- Avoid venous stasis
- Use clean techniques

## Golden Period

- Early intervention key to minimize infection
- 100 organisms/g tissue → 100,000 organisms/g tissue
- Class 1
  - < 6 hr
- Class 2
  - 6 - 12 h
- Class 3
  - >12 h

## Goal

- Prevent further contamination
- Debride necrotic tissues
- Remove debris and contaminants
- Provide drainage
- Establish viable wound bed
- Achieve closure

## Wound Healing

- Inflammatory phase
  - Lasts about 5 days
- Proliferative phase
  - 5-20 days after injury
  - 4 key processes
- Maturation phase
  - 20 days to 1 year



## Proliferative Phase

- Neovascularization
- Fibroplasia/collagen deposition
- Epithelialization
  - Extend into maturation phase
  - Generally thin and fragile
- Contraction
  - Up to 6 weeks
  - myofibroblasts

## Protection of Wound

- At presentation
  - Antimicrobial agents used on gauze
  - 1 part chlorhexidine solution to 40 parts saline
  - KEEP WOUND BED HYDRATED
- At preparation for wound care/closure
  - Sterile K-Y jelly
  - REMOVE HAIR



## Initial Care

- Assess remainder of patient first
  - Blood work
  - Radiographs
  - Treat shock
- Effective wound care requires anesthesia
  - Cannot debride and remove contaminants with heavy sedation

## Wound-healing Products

- Maltodextrin
  - polysaccharide
- Acemannan
  - Aloe vera
- Collagen
  - Bovine source
- Chitosan
  - Shellfish origin
- Honey
  - Hygroscopic
  - Antibacterial
  - Manuka honey
- Sugar
  - Antibacterial
  - Stimulates leukocytes
- Maggots
  - Ingests only necrotic tissues
- Aloe vera

## Topical Antibacterial Products

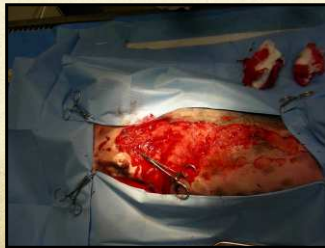
- Chlorhexidine ointment
- Silver sulfadiazine
- Triple antibiotic ointment
  
- Maintains a moist wound bed
- AVOID DOUBLE DIPPING

## Debridement

- Surgical
  - Removal of necrotic and contaminated tissues
  - Can traumatize viable tissues
- Mechanical
  - Wet-to-dry bandages
- Autolytic
  - Gels, dressing
- Enzymatic
  - Topical enzymes
- Biotherapeutic
  - maggots

\*\*\*Often used in conjunction\*\*\*

# Debridement



# Debridement

- ENZYMATIC
- AUTOLYTIC
- Proteolytic products
- Body's natural process
- Breakdown on nonviable proteins
- Selective
- Surgical debridement more effective in large wounds
- Used in conjunction with moisture retaining gels or products
- Expense a consideration

# Removal of Contaminants

- Manual removal
  - Adipose tissue can be excised
  - Manually remove debris adhered to subcutis
- Pressure lavage
  - 18 g needle with 35 ml syringe and 3 way stopcock
  - 500 ml/1000ml bottle with 1 hole in the top
  - Saline versus 0.05% chlorhexidine solution

CULTURE ONCE DONE WITH DEBRIDEMENT AND LAVAGE

# Lavage



## Wound Drainage

- Open management
  - Optimal for contaminated wounds
  - Vacuum Assisted Closure (VAC) system
- Closed wound
  - Passive
    - Penrose drain
  - Active
    - Vacuum drain systems

## Open Wound Management

- Primary layer dependent on stage of wound
  - Wet-to-dry
  - Dry-to-dry
  - Low adherent dressings
    - Telfa
    - Adaptic
    - Silver Ca Alginate
- Bandage placed to protect

## Open Wound Management



## Open Wound



## VAC System

- Subatmospheric pressure
- Removes fluid
- Improves circulation
- Enhances granulation tissue proliferation
- Commercially available
- Change every 2-3 days
- Use no more than 2 weeks
- Not a substitute for proper debridement

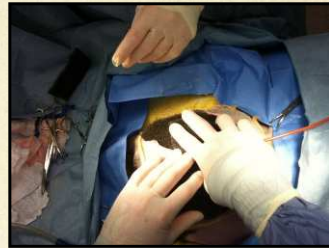
## VAC System



## VAC System



## VAC System



## VAC System



## Wound Bed

- Goal: Healthy granulation bed
- Exposed bone



# Closure

- Delayed primary
- Secondary closure
  - Skin flaps
  - Free grafts
- Second intention



# Closure



## Passive Drains

- Most economical
- Ventral exit
- Avoid having drain underneath skin incision
- Do not exit from the incision line
- Use in smaller wounds



## Active Drains

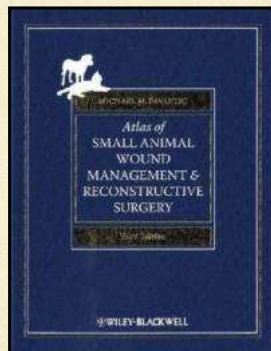
- Independent of gravity
- Collects fluid
  - Measurement of production
  - Monitoring of fluid
- Great for larger wounds



## Summary

- Cost adds up as patients require care several days to weeks
- Use of lots of bandage material/products
- Wet-to-dry bandaging with surgical debridement and care is the most cost effective and not inferior to other products and treatment
- VERY SATISFYING!!

## REFERENCE



Michael Pavletic, DVM, DipACVS