

Medi Quest BRS Hospital

A monthly News letter from BRS Hospital

WOUND CARE MANAGEMENT – PART II

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The first part of this article had discussed in detail the different types of wounds. This issue elaborates on the management modalities. Dressing forms an integral part of wound healing in addition from treating the underlying pathology. Wounds may heal by conservative management or it may be the initiation to provide a surgical cover like skin graft or flap cover.

Wound care methodology has evolved over the years and occlusive dressings have been designed to protect a moist environment. Chronic wounds cause an enormous strain on the patients and health care systems.

Table 1: Wound prevention and Management Quick Reference Guide

Recommendations Associated with the Five Steps in the Wound Prevention and Management Cycle

Step	Recommendation
1 Assess and/or Reassess	1.1 Select and use validated patient assessment tools. 1.2 Identify risk and causative factors that may impact skin integrity and wound healing. 1.2.1 Patient: Physical, emotional and lifestyle 1.2.2 Environmental: Socio-economic, care setting, potential for self-management 1.2.3 Systems: Health-care support and communication 1.3 Complete a wound assessment, if applicable.
2 Set Goals	2.1 Set goals for prevention, healing, non-healing and non-healable wounds. 2.1.1 Identify goals based on prevention or healability of wounds. 2.1.2 Identify quality-of-life and symptom-control goals.
3 Assemble the Team	3.1 Identify appropriate health-care professionals and service providers. 3.2 Enlist the patient and their family and caregivers as part of the team. 3.3 Ensure organizational and system support.
4 Establish and Implement a Plan of Care	4.1 Identify and implement an evidence-informed plan to correct the causes or co-factors that affect skin integrity, including patient needs (physical, emotional and social), the wound (if applicable) and environmental/system challenges. 4.2 Optimize the local wound environment aided through 4.2.1 Cleansing 4.2.2 Debriding 4.2.3 Managing bacterial balance 4.2.4 Managing moisture balance 4.3 Select the appropriate dressings and/or advanced therapy. 4.4 Engage the team to ensure consistent implementation of the plan of care.
5 Evaluate Outcomes	5.1 Determine if the outcomes have met the goals of care. 5.2 Reassess patient, wound, environment and system if goals are partially met or unmet. 5.3 Ensure sustainability to support prevention and reduce risk of recurrence.



**GENERAL MEDICINE , GENERAL SURGERY,
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(ISO 9001-2015 CERTIFIED)

Newer occlusive dressings speed up re-epithelialization, stimulate collagen synthesis, create a hypoxic environment at the wound bed to promote angiogenesis & decrease pH at wound surface, creating an environment inhospitable to bacterial growth, which decreases the rate of wound infection

Table 2: Characteristics of an ideal dressing

- High moisture vapor permeability
- Non adherent
- High capacity for absorption
- Provide barrier to external contaminants
- Prevents capillary loops penetrating into dressing material
- Capable of being sterilized
- Good adhesion to surrounding skin
- Hypoallergenic
- Comfortable to wear
- Cost effective

TIME-

T- Tissue Viability

I- Infection

M- Moisture Imbalance

E- Epidermal Margin/ Edge of Wound

Tissue Viability-

- Viable (Granulation , Epithelialising)
- Non viable (Necrotic , Sloughy , Eschar)- prolongs inflammation, impedes epithelialization, medium for bacterial growth

Infection-

- Signs of advancing erythema, fever, warmth, edema, pain, purulence
- Delayed healing
- Abnormal granulation tissue
- Bad odour

Moisture Imbalance :

Too much moisture leads to maceration of skin.

Epidermal margin – Necrotic tissue needs to be debrided

Table 3: Classification of the newer wound care products

Products which enhance epithelialization	Collagen dressings, Hydrogels, Hydro foams, hydrocolloid, growth factors
Products which prevent infection	Antimicrobials like silver impregnated dressings, mupirocin, retapamulin
Desloughing and debriding agents	Maggots , Debridace, enzymatic agents (Collagenase , papaya extracts), Hydrocision
Products which enhance granulation tissue formation	Hydrocolloids , Hydrogels, Alginates, Collagen granules, VAC

Topical antiseptics and antimicrobials

The antiseptics used very commonly are hydrogen peroxide, iodine-based preparations and Eusol. Antimicrobials are Bacitracin A, Neomycin, Fucidin, Mupirocin, Retapamulin.

However, because of its extensive use the incidence of resistance to mupirocin is also increasing.

Silver impregnated dressings

Silver is well known as an antiseptic agent (silver nitrate and silver sulphadiazine) incorporated into gauzes, hydrocolloids, alginates, foams, creams and gels, The development of nanochemistry has produced micro fine particles which increase silver's solubility and releases silver ions in concentration of 70-100 ppm. Nanocrystalline silver system kills all microbes found in the wound including fungi, MRSA and vancomycin-resistant enterococcus.

Silver absorbed by epidermal cells induces production of metallotheine which in turn increases uptake of zinc and copper, which increases RNA and DNA synthesis.



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The Acticoat three layered dressing absorbent rayon/polyester core laminated between upper and lower layer of silver-coated high density polyethylene mesh.

Foam

Foam are highly absorbent polyurethane dressings cavity nonadherent, easy to apply and remove and are meant for highly exuding wounds.

Alginates

Alginates are composed of soft, non-woven fibres, which contain calcium and sodium salts of alginic acid. When placed over a moist wound, an ion exchange reaction occurs between calcium in the alginate and sodium in the wound fluid producing soluble calcium–sodium alginate -- a gelatinous mass, which helps in maintaining moist environment and facilitates autolytic debridement.

Hydrocolloids

Hydrocolloids are composed of gelatine, pectin and or carboxymethylcellulose, and serve as occlusive or semi-occlusive dressings. They are impermeable to water, bacteria and other contaminants but permeable to water vapour. They absorb wound exudates to form a hydrophilic gel.

Hydrofibres

Hydrofibres are sterile sodium carboxymethyl cellulose fibres. They conform to the wound surface, are highly absorbent and interact with wound exudates to form a gel. They thus maintain a moist environment and allow autolytic debridement.

Hydrogels

Hydrogels are effective debriding and desloughing

action by rehydrating necrotic tissue and removing it without damaging healthy tissue and absorbing slough and exudates. They are best suited for dry wounds or those with minimal exudates.

Transparent films

waterproof but permit water vapour wounds can be inspected wounds with minimal exudates.

Debridement

Enzymatic debridement Collagenase and papain
High pressure water irrigation Hydrocision or pressurized irrigation surgical debridement and cleaning of the wound water, saline or antibiotic solution

Negative pressure wound therapy

Negative pressure wound therapy (NPWT) or vacuum-assisted closure (VAC) has played a major role as a bridge to reconstruction

Pressure used is negative pressure or sub atmospheric pressure (100-125 mm Hg) macro strain (physical response) and micro strain (biological response) removes exudates by an electromechanical pump.



Negative pressure may act by decreasing oedema, by removing interstitial fluid and by increasing bloodflow. As a result, bacterial counts decrease and cell proliferation increases, thereby creating a suitable

bed for graft or flap cover.

Growth factors

Growth factors are obtained either autogenously by utilizing body's platelets or macrophages or biochemically (recombinant). Recombinant human Platelet derived growth factor (rhPDGF), Fibroblast growth factor, granulocyte Epidermal growth factor (EGF) promotes chemo tactic recruitment and proliferation of cells involved in wound repair. EGF also regulates cell proliferation, migration and differentiation.

Skin substitutes

Skin substitutes protect wound from fluid loss and infection replace extracellular matrix molecules.

Collagen

Chronic wounds are now treated with topical collagen products that improve wound healing by laying down a matrix which favours deposition of new tissue and attracts cells necessary for healing. They are usually of human, porcine or bovine origin and are available as particle or sheet form. They absorb wound exudates to form a soft biodegradable gel over the wound surface, which maintains wound moisture.

Future of wound care

Engineering techniques like stem cells and gene therapy for achieving wound closure.

CONCLUSION

Rapid advances over the last 25 years has helped us in understanding of the biology of chronic non-healing wounds,

(Next issue of '**Mediquest BRS Hospital**' will discuss the Surgical management of wounds.)

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