

Wound Management in Primary Care: A Review

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ABSTRACT

In this review, we discuss assessment methods of patient's step by step in primary care. We outline the cleansing methods of wounds and guidelines for wound management depending on the type of wound. We review the most updated studies in the management approaches wound in primary care, but we also included some studies which have been published earlier since 1995 December, up to November, 2017. The Medline (PubMed) and Embase databases were searched for relevant articles related to our concern subject. Holistic assessment involves identifying, gathering and interpreting information about the patient and wound to ensure accurate diagnosis, appropriate treatment, ongoing monitoring and prevention of complications. For successful management of patients wounds, physicians need proper understanding of the recovery procedure. The use of a standardized, systematic method of evaluation assists the practitioner in the accurate investigation of the wound, with the general goal of assuring optimal wound healing in addition to patient outcomes. Acute wound management varies based upon the wound location and characteristics. No single method can be applied to all wounds; however, a systematic technique to acute wound care integrated with current best practices gives the structure for exceptional wound management

Keywords: Wound, physical trauma, Primary Care, wound management.

INTRODUCTION

The method of wound care has enhanced tremendously and evolved over the years. The Greek physician Galen (120-201 A. D) had actually kept in mind empirically that wounds recover efficiently in a moist environment. However, for almost 2000 years, therapeutic efforts had actually concentrated on drying the wound site with absorptive gauzes functioning as main stay for wound management. They even promoted debridement, if utilized as a wet to dry dressing. The value of these gauze dressings is currently questionable due to the pain and damages that they trigger to the neo-epithelium throughout removal. In 1962, **Winter**^[1] discovered that occluded wounds needed much less time for epithelialization compared to wounds left open to air, which was sustained by **Cho and Lo**^[2]. A closed dressing exposes the wound constantly to proteinases, chemotactic, enhance & development factors in the surrounding liquid, which may be otherwise lost in case the injury is left exposed^[3]. Even the electrical gradient required for stimulation of fibroblasts and epithelial cell migration is maintained and additional trauma to the injury is prevented by this physical obstacle. In late 20th century, more medical data was released in help

of this and producers started producing occlusive wound dressings, which were designed to maintain and secure a moist environment in the injury. Newer occlusive dressings accelerate re-epithelialization, promote collagen synthesis, produce a hypoxic environment at the injury bed to promote angiogenesis & decline pH at injury surface, creating an environment inhospitable to bacterial growth, which reduces the rate of wound infection^[4]. They have an edge over gauze dressings in regards to patient comfort, convenience and compliance as well as better cosmetic outcomes as a result of decreased scarring^[5]. The idea of establishing modern dressings is to manipulate the wound environment in deliberate methods. The huge variety of products offered in the market today makes choice of one of the most suitable dressing for any wound an extremely difficult task.

Nonetheless, the standard principles of injury management should not be disregarded and these therapeutic modalities must not be used as a panacea to injuries, which could lead to disasters.

In this review, we discuss assessment methods of patient's step by step in primary care. We outline the cleansing methods of wounds and guidelines for

wound management depending on the type of wound.

METHODOLOGY

We reviewed the most updated studies in the management approaches wound in primary care, but we also included some studies which were published earlier since 1995 December, up to November, 2017. The Midline (PubMed) and Embase databases were searched for relevant articles related to our concern subject, and then evidence was extracted careful from each study, to be able to performed this review as an updated study for all treatment approaches of wound in primary care.

The study was done after approval of ethical board of King Abdulaziz university.

DISCUSSION

• Patient assessment

The very best quality injury management is inefficient if the patient's danger and other contributing factors are ruled out throughout the evaluation, along with their participation in and acceptance of therapy. Conditions such as diabetes, heart disease, respiratory disease, anemia, immune disorders, renal failing and obesity, and simultaneous systemic influences such as ageing, smoking, movement, nourishment and stress, are essential in determining the advancement or incident of a wound and exactly how, or whether, it heals. This is since optimum healing relies on the injury environment being clean, not infected, adequately perfused, nourished and free of foreign or devitalized material.

Evaluation involves determining, event and interpreting information about the patient to make certain diagnosis is precise, appropriate therapy decisions can be made, the patient and the injury can be checked, and problems can be avoided. It is additionally essential to guarantee affordable use of resources and a positive experience for the patient. Evaluation includes consideration of the patient's age, the history of today trouble and the individual's past and existing drug, medical and family background, nutritional status, chronic clinical conditions, lifestyle choices, psychological status and socioeconomic situations^[6]. The expert has to be well-informed and familiar with the significance of the analysis in addition to permitting sufficient time to conduct the evaluation extensively and effectively, making the suitable links and documenting the information accordingly.

Wounds need to be prevented, where possible, to ease the burden of distress, anxiety, pain, embarrassment, inconvenience, morbidity, hospital admission and even death associated with wound difficulties. An accurate, all natural analysis ought to recognize possible barriers to recovery and notify the injury care plan. However, successful healing, where feasible, is eventually identified by the general health of the patient.

It is acknowledged that the emphasis of palliative wound care is wound management because most of these wounds do not cure. In addition to the patient's medical history, the reason for the injury, any type of medication or allergic reactions, the patient's life-style and environment, the availability of social support and any type of mental problems should be taken into consideration. **Baranoski et al.**^[7] given a helpful structure to assist the evaluation procedure, the 'Nine Cs of injury analysis', comprising:

- Cause of the wound.
- Clear picture of what the wound looks like.
- Comprehensive picture of the patient.
- Contributing factors.
- Communication to other healthcare practitioners.
- Continuity of care.
- Centralised location for wound care information.
- Components of the wound care plan.
- Complications from the wound.

Patient assessment includes a complete health examination of all skin areas for: indications of dermatological disorders; scarring, particularly over pressure points; skin modifications, such as those related to venous stasis; the condition of the skin, hair and the nails of the extremities; skin colour; temperature; pulse; capillary refill; and oedema. Failure to finish a holistic evaluation of the patient may lead to a multitude of complications and has the prospective to misdirect therapy.

• Wound assessment

A simple description of a wound is 'an injury or damage, generally restricted to those caused by physical means with disruption of regular connection of structures'^[8]. Once the source of the wound is confirmed, it is necessary to consider criteria such as whether the wound is acute or chronic, the stage of healing, how it is healing, whether there are any visible obstacles to healing and the patient's mindset to having a wound. Nonetheless, two problems that occur are that evaluation of these parameters is mainly subjective and precise assessment relies on the knowledge, experience and ability of the

specialist. Failure of evaluation of the wound precisely can lead to life-altering sequelae for patients and disciplinary and/or legal repercussions for the practitioner.

• **Type of wound**

Acute wounds advance with the regular stages of wound healing are typically recover without problem in a healthy individual. Chronic wounds do not progress typically through the stages of healing, resulting in prolonged recovery times and/or non-healing. Recovery of chronic wounds could occur in between four weeks ^[9] and 12 weeks ^[10]. Lacerations, contusions, skin tears and surgical wounds are usually categorised as acute wounds; however, it is feasible that acute injuries might become chronic in people with significant comorbidities and risk aspects.

These injuries need tracking, since they may deteriorate into chronic wounds. Pressure ulcers, leg abscess, diabetic foot ulcers and malignant wounds are categorized as chronic wounds, with the connected underlying threat variables of stability and chronic venous hypertension, or the impacts of diabetes or cancer affecting their advancement. In these situations, the wound is effectively chronic from its advancement and needs to be managed as such. The generation of exudate is an essential part of the moist wound healing process. However, the amount produced and the elements of exudate in acute and chronic wounds vary. Growth elements, wound debris, electrolytes, enzymes, sugar, leukocyte, red cell, platelets, fibrin and fibrinogen are found in typical wound exudate ^[11]. In an acute wound, the exudate is abundant in endogenous proteases that contribute to the proliferation and growth of new cells, hence helping with wound closure and recovery.

Wysocki *et al.* ^[12] compared levels of activated metalloproteinases (MMP) in acute (mastectomy) wound liquid and chronic (leg abscess) injury liquid. The writers found elevated levels of MMP in the chronic wound fluid, which could cause slower tissue turnover and failed wound closure. Physiologically, the recovery of chronic wounds could be influenced by an extended inflammatory phase ^[13], duplicated infections ^[14] and the formation of biofilms ^[15]. These aspects raise the hassle, pain and anxiety to patients, in addition to increasing related health care costs. An understanding of the recovery procedure and whether an injury is acute or chronic is needed in the onset of wound evaluation to establish an appropriate therapy plan.

Table1. Factors affecting wound healing ^[16].

General factors	Local factors
<input type="checkbox"/> Underlying disease.	<input type="checkbox"/> Hydration.
<input type="checkbox"/> Vascularity.	<input type="checkbox"/> Wound management.
<input type="checkbox"/> Nutritional status.	<input type="checkbox"/> Wound temperature.
<input type="checkbox"/> Immune status.	<input type="checkbox"/> Pressure, friction and shearing forces.
<input type="checkbox"/> Obesity.	<input type="checkbox"/> Foreign bodies.
<input type="checkbox"/> Disorders of sensation or movement.	<input type="checkbox"/> Wound infection.
<input type="checkbox"/> Psychological state.	<input type="checkbox"/> Pain levels.
<input type="checkbox"/> Radiation therapies.	
<input type="checkbox"/> Drugs – prescribed, recreational and/or alternative therapies.	
<input type="checkbox"/> Allergies and/or sensitivities	

• **Type of healing**

Wounds recover in different ways in accordance with the device of injury and the amount of tissue loss. In primary or first objective recovery, tissue is recovered directly in uncomplicated wounds, such as calculated incisional wounds without any or minimal tissue loss where the wound sides are held in apposition to each other ^[17], without any formation of granulation tissue. Where the wound sides cannot be opposed, fibroblasts proliferate and capillaries fledgling around the base and sides of the wound to form granulation tissue to fill up the problem. This happens throughout additional intent healing in injuries where there is a varying quantity of tissue loss, usually providing as ulceration. If the tissue loss is comprehensive, grafting could be needed to preserve structure and feature. Tertiary intent or delayed primary closure may be needed in highly contaminated wounds and where the superficial layers are left open and stuffed lightly with dressings complied with by closure after four to 5 days. These may be bite wounds or dehiscid surgical wounds made complex by infection ^[18].

• **Cleansing techniques:** Proper wound preparing improves healing and outcomes ^[19]. While evidence-based referrals for wound care exist, many specialists continue to treat wounds based on individual choice- some using unnecessary or perhaps detrimental techniques ^[19]. Acute wound cleaning includes 3 various techniques: compresses, irrigation, and soaking (Table 2). The strategy used and level of cleansing depend on the type of injury, environmental considerations, and problem of the wound on discussion.

Table 2. Cleansing methods

Cleansing method	Description	Purpose	Potential risks
Compress	Gently pressing excess moisture from a moistened gauze/cloth applied to the wound and removing after wound contact to remove surface debris. The cycle can then be repeated	Astringent action (coagulate protein) to remove surface debris from the wound	• The compress can stick to the wound surface or there may be local pain from application or removal
			• Faulty technique can introduce infection
Irrigation	Steady flow of solution across wound surface	Hydrate the wound	• More trauma if pressure too high
		Remove deeper debris	• Splash back
		Assist with visual exam	• High pressure may drive bacteria into deeper compartments
Soaking	Immersion of wound in solution applying an over-hydrated cloth or gauze to the wound surface (no removal of excess moisture prior to application)	Hydrate the wound	• Disruption of moisture balance
		Allow for physical removal of debris	• Maceration of surrounding skin
			• Impaired healing with introduction of bacteria from immersion fluid

• **Closure considerations**

Primary wound closure incorporates suture, tissue adhesive, staples, and strips individually or in conjunction with each other. Sutures remain the most usual closure technique, sustained by years of refinement and safety. Low to medium tension wounds are closed by percutaneous sutures using a reduced reactive product consisting of monofilament sutures such as nylon or polypropylene. Surgical strips, just proper for wounds with reduced tension, have reduced sensitivity and are often utilized along with another closure technique. Wounds that are either stapled or glued appear to have comparable outcomes, but glues are less painful and placed more quickly [20]. Tissue adhesives are connected with significantly even more dehiscence than sutures and are most proper for non-mucosal facial wounds and low-tension extremity wounds [20].

Complicated wounds need to be closed in 2 layers utilizing absorbable sutures such as polydioxanone (PDS), polyglycolic acid (Dexon-Plus), or polyglactin 910 (Vicryl).

Staples are faster to place and less expensive than sutures. When wounds are properly prepared and the website is properly picked, staples have the tendency to have reduced injury infection rates with less complications [21]. If utilized on the scalp, staples are not related to any type of greater scar development compared to stitches. However, if left in position as well long, staples might lead to higher mark formation [21]. Staples are commonly made use of on the scalp, trunk, and extremities- locations much less prone to cosmetic considerations.

• **Healing heavily contaminated wounds**

Wounds that are greatly contaminated could require delayed primary closure to reduce the risk of infection. These wounds are cleansed, debrided, and dressed with a moist dressing, then covered to prevent further contamination. The moist dressing is commonly transformed daily and the wound reassessed after 3 to 4 days. If no signs of infection exist after re-examination, secondary closure can be done. Exceptionally unclean wounds may take

advantage of everyday cleaning and dressing changes for the very first 3 to 5 days before closure.

In situations where secondary closure can not be done, healing by secondary intent is usually used. No effort for helped injury closure is supplied.

- **Aftercare**

There are a number of aspects that straight effect injury result. A wet injury recovery atmosphere has been shown to help prevent cell dehydration and death, advertise angiogenesis, and enhance phagocytosis and development aspect discussion. Moisture likewise improves the rate of re-epithelialization, decreases discomfort, and enhances the cosmetic result [22]. It is important that proper wound dressing, patient education related to wound care, appropriate environmental considerations, and scientific follow-up are discussed. Generally, referral to the patient's primary care physician or outpatient center will be necessary for evaluation of the recovery procedure or follow-up depending upon the closure technique.

- **Acute care of chronic wounds**

Chronic wounds, consisting of diabetic foot ulcers, venous leg ulcers, and pressure ulcers, are complicated and often present to the ED. The wound bed preparation (WBP) version is utilized to systematically deal with chronic wounds and optimize achievable patient outcomes [23], [24]. The 3 essential elements of regional chronic wound care are represented by the letters DIM: debridement, infection and swelling control, and moisture balance. Advanced active therapies are used to stimulate the non-advancing side or promote healing of the stalled wound by other systems.

In order to deal with a diabetic foot ulcer, it is important to consider the VIPS: evaluate vascular supply; treat infections; rearrange plantar pressure with shoes, orthotics or special tools; usage sharp surgical debridement if the wound is healable.

Patients with venous leg ulcers need bandaging to heal and stockings to preserve blood circulation. An ankle brachial pressure index higher than 0.8 requires high-compression bandaging, whereas patients with worths between 0.6 and 0.8 can be bandaged with changed compression. Patients with pressure ulcers require pressure decrease through analysis of beds, bed mattress, and seating. In addition to pressure, various other problems have to be addressed consisting of excess moisture (urinary system and fecal urinary incontinence), nutrition, movability, and friction and shear.

- **Additional wound considerations**

The non-healable wound has either inadequate vasculature or a coinciding aspect that restricts the healing process. In general, immunosuppressive therapy, tissue ischemia, bad wound repair service, and other injury attributes could all present threat aspects for poor wound end results [25]. Therapy of injuries with poor vascular supply or certain coinciding clinical conditions recover by secondary intent and require long-term maintenance.

Wound depth is an aspect that impacts the rate of healing. Superficial wounds in otherwise healthy individuals, including only the epidermis and papillary dermis, are anticipated to heal within 10 days with appropriate therapy and no difficulties [26]. Partial thickness wounds, such as a skin graft donor site, generally use up to 21 days to recover [27]. Full thickness wounds undertake 2 phases of recovery. Primary healing of the deep tissue within 7 days' post-injury allows for secondary recovery via re-epithelialization and contraction.

CONCLUSION

Holistic assessment involves identifying, gathering and interpreting information about the patient and wound to ensure accurate diagnosis, appropriate treatment, ongoing monitoring and prevention of complications. For successful management of patients and wounds, physicians need proper understanding of the recovery procedure. The use of a standardized, systematic method to evaluation assists the practitioner in the accurate evaluation of the wound, with the general goal of assuring optimal wound in addition to patient outcomes. Acute wound management varies based upon the wound location and characteristics. No single method can be applied to all wounds; however, a systematic technique to acute wound care integrated with current best practices gives the structure for exceptional wound management. The variety of acute wounds providing to the ED challenges the doctor to select one of the most appropriate management to promote recovery. To manage with chronic wound physician needs to have history along with knowledge of the healing potential of the wound, as it relates to the certain medical and environmental considerations for each patient, provides the basis of decision making for wound management. It is necessary to consider each wound separately in order to create the optimal conditions for wound recovery.

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