Quantifying wound fluids for
the clinician and researcher

Wound care, clinical trials and research all require having an accurate and reproducible means of describing wound appearance and exudate using a standardized language.

By Gerit D. Mulder, DPM, MS

Introduction

Quantification and qualification of wound exudate is of concern to those involved both in clinical research and in the day-to-day treatment of wounds. References are frequently made in research and other medical journals to types, quantities, and characteristics of wounds and wound exudate. No literature is available which defines a standard for exudate amount and quality, or for wound base appearance. Wound care, clinical trials, and research all require having an accurate and reproducible means of describing wound appearance and exudate. To date, terminology has not been standardized, resulting in numerous definitions which may be misleading and inaccurate. The following manuscript proposes a simple yet accurate standard for exudate quantification, qualification and wound bed description so that clinicians and researchers can speak the same language, and so that results from different studies can be compared.

Quantifying of wound fluids

The terms minimal, medium, large, light, moderate, and heavy are all used to denote quantities of exudate in medical literature. The reader is left to speculate how much is implied. The approach included in this manuscript and reflects frequent use by clinicians and researchers beyond the scope of this paper. The approach is consistent with the guidelines for evidence-based care.

Scoring systems have been designed to be used in clinical settings to describe how wounds are healing before and after treatment. Scoring is the tool used to determine whether to increase or decrease treatment.

These systems have been used in various types of wounds including chronic wounds which require long-term care.

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HIGHEST: These wounds exceed

and involve factors

HIGH: These wounds exceed

Middle: 

and involve factors

Mild: These wounds exceed

Intermediate: These wounds exceed

Minimal: These wounds exceed

and involve factors

\[\text{Quantiles of} \quad P_H > 2.4\]

\[\text{Quantiles of} \quad P_H > 2.4\]

where no options are available.

Abstract: This is limited

Quantum-wound hicks
Qualification of exudate

Descriptions of exudate are equally confusing. Yellow exudate discharging from a wound has been described as serous, pustular, fibrous, cloudy and numerous other terms. The following terminology is suggested when describing fluid exuding from a wound surface. Although the following terms are not all inclusive, they serve to standardize the description of fluid. These terms may also be combined to describe a particular wound.9

Serous: clear fluid with apparent visual absence of blood, pus or other visible debris.

Sanguinous: bloody; appearing to be composed entirely of blood.

Serosanguinous: blood mixed with obvious quantities of clear fluid. It is necessary to visualize both components of the exudate when using this term.

Purulent: pus-like in appearance; cloudy yellow and viscous.

The above terms are not designed to determine infection or colonization. Diagnosis of infection must be made by clinical signs and symptoms and appropriate testing. It is beyond the scope of this article to discuss infection.

Wound base qualification

The most difficult qualification of a wound may be the appearance of the wound base. Wounds may present with a variety of appearances depending on wound etiology and stage. A base which is red in appearance may be described as granulating, hypoxic, dusky, unhealthy or by any number of other terms depending on the training and experience of the evaluator.

Attempts to simplify wound appearance into three categories: (black, yellow, and red, for example) may be misleading and inaccurate at best. Treatment selection based on this simplified approach may result in inappropriate care. A red wound may be described as having a red granulating base, yet some ischemic wounds may present with a grayish-red base. Pressure ulcers, when present over areas of tissue where the pressure has not been adequately reduced and where a localized ischemia still exists may also present with a dusky red appearance. Diabetic ulcers may present with a red appearance yet have no indication of granulation.

An understanding of the definition of granulation as well as reepithelialization is necessary before equating these terms with colors. Granulation is defined as “the formation in wounds of small, rounded masses of tissue composed largely of capillaries and fibroblasts, often with inflammatory cells present.”9 Reepithelialization is defined as “the recovering of a denuded area with epithelium.”9

Colors are determined by arterial flow, localized perfusion, trauma, underlying pathophysiology, debris, and fibrotic and necrotic tissue. Each color should be further qualified by an appropriate term which provides additional information in assessing whether a wound is healthy and healing or whether it is chronic in nature.

The following terms are designed to assist in the assessment of progress of wound healing:

Red-reepithelializing: bright red with indications of superficial cell migration.

Red-granulating: bright or true red in appearance associated with islands of granulation tissue.

Red-chronic: red appearance but no indication of granulation.

Red-dusky: dull, grey or dark red in appearance without signs of granulation, with or without signs of localized ischemia.

Yellow-granulating: areas of fibrotic tissue* present in conjunction with areas of granulating tissue. No necrotic tissue present. (*please note that fibrin cannot be categorized as “healthy” or “unhealthy.”)

Yellow-chronic: areas of fibrotic tissue without areas of granulation.

Yellow-ischemic: fibrotic tissue in conjunction with signs of ischemia or tissue necrosis.

Black-dry: dry, desiccated eschar whether black or brown in appearance.

Black-wet: wet gangrenous appearance.

Black-mixed: areas of necrotic tissue present with areas of yellow and/or red tissue.

Distally...

This article is not intended to discuss wound fluid continuously. The role of wound fluid in maintaining or improving the wound healing process is well documented. The role of wound fluid in providing the necessary conditions for the epithelialization process is less clear. The wound fluid plays a role that is dependent on the stage of the healing process.
Conclusion

Genae. Failure to products that of woman can contribute to the development of maternal stress. This may be due to the lack of understanding of the psychological and emotional needs of the mother during pregnancy. The well-being of the mother is crucial for a successful pregnancy outcome.

Discussion

The author acknowledges the difficulties in quantifying the incidence of maternal depression and its impact on maternal health. Further research is needed to better understand the prevalence and nature of maternal depression, and to develop effective interventions to support maternal well-being.