

# Evaluation of a Cyanoacrylate Protectant\* to Manage Skin Tears in the Acute Care Population

Catherine T. Milne APRN, MSN, CWOCN<sup>1</sup> Debbie Valk RN-BC<sup>2</sup>,  
Marty Mamrosh RN-BC<sup>2</sup>

<sup>1</sup>Connecticut Clinical Nursing Associates, LLC  
Bristol Hospital Wound, Ostomy, Lymphedema Center


<sup>2</sup>Staff Nurse, Bristol Hospital,  
Bristol, CT

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## INTRODUCTION

The management of skin tears in the elderly in acute care settings is an area of concern, though it has not been studied and reported on extensively. Skin tear incidence rate in the elderly ranges from 0.9 to 2.5 per person/year<sup>1</sup>, in the long-term care (LTC) population. One study<sup>2</sup>, reports an acute care incidence range of 14-24%. It has been reported that there are 1.5 million skin tears that occur annually in the United States<sup>3</sup>. We believe that skin tears among this population are a common problem, involving the formation of painful wounds that significantly impact the quality of life.

Skin tears usually result from shear, friction or blunt trauma related insult to the skin<sup>1,2</sup>. A common sense approach to handling the problem is early identification of at risk patients, proactive prevention, and evidence based treatment. Skin tear injury consists of the separation of skin layers, and the subsequent wound may be partial or full thickness. The *Payne-Martin Classification System for Skin Tears* is commonly used to classify skin tears according to the degree of damage exhibited. The actual harm can range from minor injury, Category I, where there is no actual tissue loss, all the way to the Category III, which is complete tissue loss where the epidermal flap is absent. Another important factor about this type of injury relates to quality of life. These injuries can significantly impact quality of life due to associated pain and the potential of becoming complicated wounds if not treated properly.

Currently, products including alginates, low tack foam dressings, hydrocolloid or film dressings, are commonly used.<sup>1</sup> In general, adhesive dressings can be problematic when used to treat skin tears because their removal during dressing changes may re-injure a partially closed skin tear.<sup>6</sup> The patient experience is not uniformly positive and there is no consensus regarding best-practice for the treatment of skin tears.

Optimal methods to treat skin tears vary in the literature<sup>2,3</sup>. Specifically, cyanoacrylate dressings have been used successfully in LTC<sup>4</sup> but their utility has not yet been examined in acute care. This study examined the potential of a new generation of skin protective barriers that are claimed to protect partial thickness skin damage.

## METHODOLOGY

Using a convenience sample, topical cyanoacrylate skin protectant was applied to thirty patients with Payne-Martin Category I-III skin tears<sup>5</sup> (Table I) in one Medical-Surgical unit. Patients were assessed daily for wound pain, total number of cyanoacrylate applications, and wound complications. Nurse satisfaction with this method of treatment was also examined. Cost comparison with the usual method of skin tear protection (normal saline irrigation followed by impregnated petrolatum gauze covered with a non-adherent gauze pad and roll gauze for securement daily) on this unit was additionally performed. Pain was studied on application and daily but not on removal as this sloughs off naturally and does not require removal.

TABLE I<sup>5</sup>

### PAYNE-MARTIN CLASSIFICATION SYSTEM FOR SKIN TEARS

#### Category I: Skin Tear can fully approximate wound

Linear Skin Tear - Full thickness wound that occurs in wrinkle or furrow of skin. Both epidermis and dermis are pulled apart as if an incision has been made, exposing tissue below.

Flap-type skin tear - Partial thickness wound in which the epidermal flap can be completely approximated or approximated so that no more than 1mm of dermis is exposed

#### Category II: Skin Tear with partial thickness loss

Scant Tissue Loss - Partial Thickness wound in which 25% or less of the epidermal flap is lost and at least 75% of underlying dermis is covered by flap.

Moderate to Large tissue loss - More than 25% of the epidermal flap is lost and more than 25% of the dermis is exposed

#### Category III: Skin Tear with complete tissue loss

A Partial Thickness wound in which an epidermal flap is absent

## RESULTS AND DISCUSSION

Average length of stay on this Medical-Surgical unit was 4.5 days. The skin tear incidence rate was 3.8 %. Cyanoacrylate required one-time application for 86.7% of the patients. The 13.3% incidence of reapplication was correlated to the category and location of the skin tears. Refer to Table II for more complete demographics.

The cyanoacrylate we studied required only a one-time application for the majority of patients during the course of healing. The application of the cyanoacrylate involved significantly less costs and usage time (Table III), positively impacting labor and resource utilization. Nurse satisfaction with cyanoacrylate was high. There were no wound complications and wound pain was minimal. One patient (3.3%) reported pain on application. There was no pain to report in removal as the product sloughed off naturally and as such did not require removal using any external force or action. The purple color of the film created on the wound area made it easy to determine if reapplication was required.

Previous studies involving skin tear treatment with cyanoacrylate based "wound closure" products seem to have produced good results. In particular, Milne and Corbett<sup>4</sup> showed that skin tears that were treated with 2-octylcyanoacrylate topical bandage healed to patient and clinician satisfaction. The previously studied products, though, were very expensive and not practical from a product cost perspective. The cyanoacrylate skin protectant in this study is designed specifically for partial thickness wounds. The results suggested routine use of this type of topical protectant was a feasible alternative to more traditionally based options reported in the literature.

TABLE II

Patient/Skin Tear Demographics (n=30)		
Age (years)	80.62 (range 22-97)	
		N (%)
Gender	Male	20 (66.7%)
	Female	10 (33.3%)
Location	Upper Extremity	23 (76.7%)
	Lower Extremity	7 (23.3%)
Payne-Martin Classification	Category I	8 (26.7%)
	Category II	15 (50%)
	Category III	7 (23.3%)
Acquired	Pre-hospital	14 (46.7%)
	Hospital	16 (53.3%)



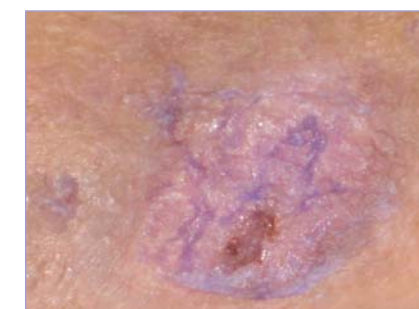
Patient A - Skin tear at injury



Patient B - Skin Tear, Payne-Martin Category II



Patient A - Skin Tear after 7 days of cyanoacrylate application



Patient B - 7 days after cyanoacrylate application

TABLE III

### COST COMPARISON OF TREATMENT

Average length of stay 4.5 days

TREATMENT	CYANOACRYLATE METHOD	PETROLATUM IMPREGANATED GAUZE METHOD
All Supplies	\$6.19	\$7.74
Nurse time* (Estimated)	\$5.00	\$25.00
TOTAL (5 day Treatment)	\$11.19	\$32.74

\*Based on an estimated ten minute application time at average nurse cost of \$30/hour. The use of cyanoacrylate results in an approximate 65% overall cost savings when compared to the use of a petrolatum impregnated gauze dressing in this study.

## CONCLUSION

The use of cyanoacrylate is a viable option to treat Payne-Martin I-III skin tears in an acute care setting. The cost benefit coupled with nurse satisfaction provides additional support for this treatment method. Further study is warranted.



Skin Tear with Cyanoacrylate in place, notice the purple coloration

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\*Marathon Liquid Skin Protectant, Medline Industries, Mundelein, IL