Simple Tool to Ensure Effective Enzymatic Debridement

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INTRODUCTION

In today's rapidly changing healthcare arena, ensuring evidence based, efficacious practice can be challenging. Currently, there is only one enzymatic debriding agent (*Clostridium* collagenase ointment) available which, if used appropriately, can be effective in removing necrotic tissue from wounds. However, there are many product interactions which can render the enzyme partially to completely inactive. For example, both the floor stocked wound cleanser and roll gauze in our facility inactivate the enzyme 100 percent. Both products were frequently found used in conjunction with the enzymatic debriding ointment. In addition to rendering the product useless, this practice was fiscally irresponsible as the *Clostridium* collagenase costs nearly $200 per 30 gram tube.

METHODS

Based on a research study published in 2012, a one page visual reference guide was created to help guide selection of appropriate topical management when using the *Clostridium* collagenase ointment (Jovanovic, et al, 2012). Our product formulary was reviewed in relation to the published research on product interactions. Using a one page "stop light" type visual guide, products with no interaction were denoted using green; those with <10% negative impact on product effectiveness were indicated in yellow; those with 10-25% were highlighted in orange, and anything with greater than 25% impact were highlighted in red. This guide was shared with colleagues, posted on units and included in our intranet wound resources for staff reference.

Figure 1. Collagenase Compatibility Chart

Collagenase Compatibility Chart

Product	% Inhibition of Collagenase	Manufacturer	Description	Comments
1/4 strength Dakin's Sol'n (0.125%)	0% Inhibition	Century Pharmaceuticals	Na+ hypocholorite solution	Compatible
Normal Saline	0% Inhibition		Saline	Compatible
Xeroform	0% Inhibition	Kendall	Bismuth in petrolatum gauze	Compatible
Hydrofera Blue	0% Inhibition	Hollister	Gentian violet & methylene blue foam	Compatible
Allevyn	0% Inhibition	Smith & Nephew	Polyurethane foam	Compatible
Carrasyn gel	0% Inhibition	Medline	Amorphous gel	Compatible
Bactroban	0% Inhibition	GlaxoSmithKline	Antibacterial cream	Compatible
Sulfamylon	0% Inhibition	UDL Laboratories	Antibacterial cream	Compatible
Mupirocin	0% Inhibition	Sigma Aldrich	Antimicrobial	Compatible
Mafenide acetate	0% Inhibition	Sigma Aldrich	Sulfonamide-based antimicrobial	Compatible
Chlorhexidine Gluconate	0% Inhibition	Sigma Aldrich	Biguanide based Antimicrobial	Compatible
Neomycin	0% Inhibition	ICN	Antimicrobial	Compatible
Polysporine	1.2% Inhibition	Johnson & Johnson	Antimicrobial mixture	Minimal Inhibition
Iodoform	1.6% Inhibition	Invacare	Iodoform impregnated strips	Minimal inhibition
Multidex	<5% Inhibition	DeRoyal	Maltodextrin with vitamin C	Minimal inhibition
Oasis	6.1% Inhibition	Smith & Nephew	Porcine submucosa	Minimal inhibition
Aquacel Ag	7.7% Inhibition	ConvaTec	Silver hydrofiber	Min inhibition
Gentamycin Sulfate	9.8% Inhibition	DPT	Antimicrobial	Minimal Inhibition
Mepilex	10.4% Inhibition	Molynycke	Polyurethane foam	Minimal inhibition
Mepilex Ag	15.7% Inhibition	Molynycke	Ionic silver silicone dressing	Min-mod inhibition
Gentamycin sulfate ointment	13% Inhibition	E. Fougera Co.	Antibacterial cream	Minimal inhibition
Silvasorb	25% Inhibition	Medline	Ionic silver	Moderate inhibition
**Silver sulfadiazine	51% Inhibition	Sigma Aldrich	Antimicrobial with silver	Incompatible
**Acticoat	52.4% Inhibition	Smith & Nephew	Nanocrystalline silver	Incompatible
**Silvadene	67% Inhibition	Keltman Pharmaceuticals	1% silver sulfadiazine	Incompatible
**Iodosorb	87% Inhibition	Smith & Nephew	Elemental iodine	Incompatible
**Benzalkonium Chloride	99% Inhibition	Sigma Aldrich	Cationic surfactant antimicrobial	Incompatible
**CarraKlenz	100% inhibition	Medline	Anionic surfactant based cleanser	Incompatible
**Kerlix gauze (PHMB)	100% Inhibition	Kendall	Bacteriostatic gauze	Incompatible
**Metronidazole	100% Inhibition	DPT	Antifungal Active	Incompatible

Reference: Jovaniovic A, Ermis, R, Mewaldt, R, Shi, L, Carson, D. The influence of metal salts, surfactants, and wound care products on enzymatic activity of collagenase, the wound debriding enzyme. Wounds. 2012; 24(9): 242-253.

Key: Green: 0% inhibition; Yellow: 0-10% inhibition; Orange: 10-25% inhibition; Red: > 25% inhibition

CONCLUSION

Product interactions should be examined carefully to ensure effective performance and positive patient outcomes.

This simple tool has been useful in translating research into practice, thereby promoting better patient outcomes and avoiding wasteful, ineffective product utilization.

REFERENCES

Jovanovic, A., Ermis, R., Mewaldt, R., Shi, L., Carson, D. The influence of metal salts, surfactants, and wound care products on enzymatic activity of collagenase, the wound debriding enzyme. Wounds. 2012; 24(9): 242-253.