

Setting up evidence-based cost-effective and clinically efficacious wound care service in a tertiary hospital in New Zealand: lessons learned

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Introduction

Antimicrobial dressing is a common strategy used to manage different wounds in clinical practice. However, many advances are not robustly tested and have been adopted into clinical practice from a combination of marketing efforts from distributors, individual clinician's preference and traditional departmental practice.

We would like to evaluate individual colleague's practice to analyse the level of evidence based practice used at workplace and its consequential health economics implications.

A uniform dressing pathway was then introduced at workplace based on latest medical evidence.

Methods

A standardised survey questionnaire on antimicrobial dressing use was sent to different medical and nursing staff in Christchurch Hospital in Emergency medicine, Plastic Surgery dressing clinic, Plastic Surgery ward, Paediatric ward and theatres.

A literature review was conducted by searching Pubmed and Medline using keywords "antimicrobials", "silver dressing", "acetic acid" and "wound" was performed.

Results

101 staff completed the survey

- 40 clinicians (5 consultants, 33 Registrars, 2 house officers)
- 61 Nurses (7 Senior RNs, 42 RNs non theatre; 1 Senior RN 11 RNs theatres)

All participants use silver-based dressing for most wounds in general without correlation to previous and/or current international consensus ($p < 0.00001$).

84 out of 88 (95%) are unfamiliar with alternative antimicrobial dressing available like acetic acid ($p < 0.00001$).

46 papers were included in the literature review.

There are no randomised clinical trial (RCT) reported comparing silver based dressing with other antimicrobial dressing in clinical practice.

2 Cochrane review groups had reported insufficient evidence that silver based dressing improves healing rate. Conversely in vitro studies suggest cytotoxic properties identified in silver based dressing.

In vitro studies reported acetic acid to be non-cytotoxic at 1% concentration but can retain antimicrobial properties even at 0.16% concentration. They also are effective at eradicating a wide range of pathogens.

Cost analysis

A single 100 ml 5% acetic acid bottle cost NZD21 and can be diluted to 2000ml (0.25% concentration) for administration while any 10cmX10cm silver based dressing cost at least NZD23.

Conservative estimate of cost of silver dressings used in the past year in the department was approximately \$56000.

Calculations based on 10 patients with 10% burn admission and 200 minor burn service in 6 months found that a predominantly acetic acid based dressing service reduces the cost of estimated current expenditure of NZD48,000 to NZD42.

A new dressing pathway was introduced in the department and rationale for this was discussed.

Demographic		Correct		Incorrect		Don't know		Chi square value, p	
101 participants		Correct		Incorrect		Don't know			
40 clinicians (5 SMOs, 33 Regs, 2 Hos)									
61 Nurses (7 SRNs 42 RNs non theatre; 1 SRN 11 RNs theatres)									
Category	Findings	Results							
	Questions								
Medical Knowledge	• Silver antibacterial activity	8	67	26				0.00001	
	• Contraindications	6	72	23					
	• Silver improves healing rate	6	53	42					
	• Does acidic environment improves/exacerbates healing?	21	18	62					
	• Cost of different dressing	1	23	77					
Clinical practice	Do you use silver dressing in							0.00001	
	• all acute burn	8	61	32					
	• all delayed burn	57		21	23				
	• superficial burn	23	38	40					
	• superficial dermal	19	23	59					
	• acute scald burn	11	21	69					
• delayed scald	1	26	74						

Conclusion

Expensive antimicrobial dressings are commonly used in clinical practice with little robust evidence to justify its choice and cost. There are conflicting evidence in regards to silver dressings and its effect on wound healing and international consensus has suggested to reserve its use in wounds with or at risk of high bioburden or local infection.

Acetic acid is increasingly used as an antiseptic agent for wounds and has been showed to be effective against a wide range of pathogens.

A carefully design standardised treatment pathway will reduce cost but also ensure patients continue to receive the best concurrently recommended treatment.