

Clinical efficacy comparison of a manual-specific enzymatic detergent versus three non-specific enzymatic detergents for surgical instrument cleaning

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Aim

The objective of this study was to compare the cleaning efficiency of a manual-specific instrument detergent and three non-manual-specific detergents, in order to optimize the manual cleaning process under manpower shortage.

Methods

A specific kind of orthopedic tray and bowls and kidney basins used at the same operation were reprocessed in this study.

Cleaning detergent by 1.Manual-specific instrument detergent : Borer Deconex Prozyme Active(M). 2.Non-manual-specific detergents : 3M Low Foam Ultra Rapid Multi-Enzyme Cleaner(X), Ruhof Endozime Premium with APA(Y) and Anios Aniosyme Synergy 5 Enzyme Detergent(Z)

Randomized 90 instruments (30 items for each category) for each detergent group were cleaned respectively by well trained staff who complied strictly the standard of process which was modified from the DGSV manual cleaning guideline¹.

Visual cleanliness and residue properties, color after cleaning and drying. The study design was showed in figure 1.

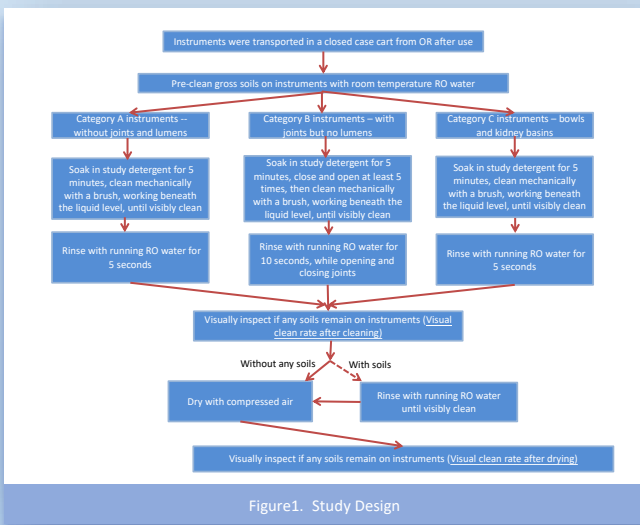


Figure1. Study Design

Results

Totally 360 instruments were tested.

- (1) **Visual clean rate after cleaning:** All instruments cleaned with detergent M were without any soil or residue after cleaning. The visual clean rate was 100% which was significant superior to the three non-manual specific detergents. (table1). All visible soils were foams and looked like detergent residues (figure2).
- (2) **Visual clean rate after drying:** 87 instruments (96.7%) reprocessed with detergent M were soil free after drying, which was significantly higher ($p < .05$) than other detergent groups (table2). All visible soils were white and greasy-feeling residues, which could be removed by scrubbing (figure3).

Table1. Visual clean rate after cleaning (N=90)

Detergent type		Product				
		Manual-Specific	Non-manual specific			
		Prozyme Active	Low Foam Ultra Rapid Multi-Enzyme Cleaner	Premium with APA	Aniosyme Synergy 5 Enzyme Detergent	
No visible dirt residue	Yes	Count	90	61	44	18
		% in the same product	100.00%	67.80%	48.90%	20.00%
	No	Count	0	29	46	72
		% in the same product	0.00%	32.20%	51.10%	80.00%

Table2. Visual clean rate after drying (N=90)

Detergent type		Product				
		Manual-Specific	Non-manual specific			
		Prozyme Active	Low Foam Ultra Rapid Multi-Enzyme Cleaner	Premium with APA	Aniosyme Synergy 5 Enzyme Detergent	
No visible dirt residue	Yes	Count	87	14	49	50
		% in the same product	96.70%	15.60%	54.40%	55.60%
	No	Count	3	76	41	40
		% in the same product	3.30%	84.40%	45.60%	44.40%

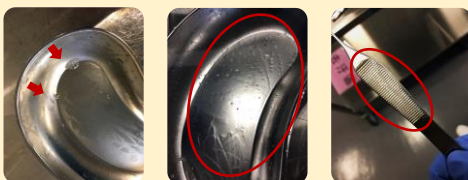


Figure2. After cleaning show foams residue

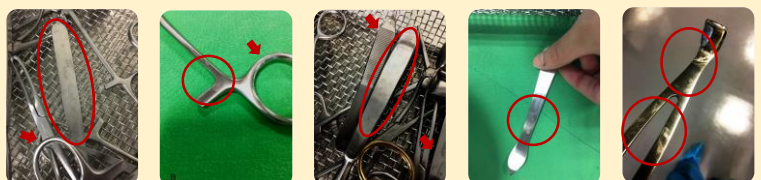


Figure3. After drying show white and greasy-feeling residues

Discussion and conclusions

The study results showed the manual-specific detergent (M) had much better cleaning efficacy under the same duration of rinse time. In contrast, instruments cleaned with non-manual-specific detergents (X, Y and Z) had much more residues after cleaning and drying and needed to be further rinsed and/or re-cleaned. This study confirmed the application of the manual-specific detergent in this unit regarding the time saving with superior cleaning quality.