



DENTISTRY UPDATE

FULL REPORTS: 1) Alcohols, CRA Newsletter Nov. '96, 20:1-2. 2) Chlorines, CRA Newsletter Mar. '94, 18:2. 3) Cleaner, CRA Newsletter Jul '02, 26:3. 4) Lysol, CRA Newsletter Jun. '07, 31:1. 5) Optim, CRA Newsletter Apr. '07, 31:3-4. 6) Phenolics, CRA Newsletter Jan. '95, 19:2-3. 7) Quats, CRA Newsletter Dec. '00, 24:2-3. 8) Wipes, CRA Newsletter Apr. '99, 23:3

ENVIRONMENTAL SURFACE DISINFECTANTS

Disinfectants for environmental surfaces must kill rapidly and thoroughly. To identify products meeting these requirements, CRA purchased and tested disinfectants from all over the world. The following chart of products still on the market and tested by CRA summarizes 19 alcohol-based products where only 2 passed all tests used by CRA; 10 chlorine-based products where only 2 passed all tests used by CRA; 1 chlorine and bromine-based product, 2 iodophore-based products, 4 products with miscellaneous active ingredients, 6 phenolic-based products, 6 quaternary ammonium chloride-based products, and 4 wipes where none passed all tests used by CRA.

MATERIALS & METHODS: Tuberculosis bacteria and polio virus are used as test organisms because they are human pathogens with known resistance to kill by many disinfectants. Results are reported as log₁₀ reductions of 10⁷ test organisms exposed to disinfectants for 1, 3, and 10 minutes using 3 different tests performed in triplicate, without and with fresh human whole blood present. By convention, less than a 3 log₁₀ reduction constitutes inadequate kill. Full methods are described in following publication: Christensen, R.P., et al., JADA '89; 119:493-505, and on CRA's website (www.cliniciansreport.org) under "Additional Study" (*Infection Control, Environmental Surface Disinfectants, Alcohols, Nov. '96*).

RED AREAS ON CHART INDICATE INADEQUATE KILL

Not tested

DISINFECTANT NAME	COMPANY	COUNTRY	MAJOR ACTIVE INGREDIENT(S)	TEST TIMES	POLIO VIRUS I (Mahoney)		TUBERCULOSIS ORGANISM (<i>M. bovis</i>)						
					SUSPENSION TEST		SUSPENSION TEST		SURFACE TEST				
					WITHOUT BLOOD	WITH BLOOD	WITHOUT BLOOD	WITH BLOOD	WITHOUT BLOOD	WITH BLOOD			
ALCOHOL-BASED													
1. 70% ETHYL RUBBING ALCOHOL	Walgreens	USA	70% Ethanol	1 min. 2.0 3 min. 3.5 10 min. 4.8	0.0 0.0 0.1	4.3 4.3 4.4	4.0 4.2 4.2						
2. BACTOL BLUE	Whiteley Industries	Australia	70% Ethyl alcohol (w/w)	1 min. 1.0 3 min. 3.1 10 min. 3.7	0.1 0.2 0.3	>5.1 >5.1 >5.1	4.5 4.9 5.3						
3. BIOSURF	Micrylium	Canada	70.5% Ethyl alcohol (w/w) 0.20% Chlorhexidine Gluconate (w/w)	1 min. 4.1 3 min. 4.9 10 min. 4.9	0.7 2.0 2.1	5.4 5.6 5.6	4.4 4.4 4.5	5.4	3.9				
4. CITRACE	Caltech Industries	USA	66.6% Ethyl alcohol (w/w)	1 min. 4.4 3 min. 4.4 10 min. 3.9	0.3 1.0 1.5	>4.7 >4.7 >4.5	4.4 4.4 4.6			5.0	3.9		
5. CITREX	Caltech Industries	USA	69.1% Ethyl alcohol (w/w)	1 min. 4.1 3 min. >5.0 10 min. >5.0	0.9 1.6 2.3	>4.6 >4.6 >4.6	>4.6 5.2 5.2			>5.1	3.8		
6. CLOROX DISINFECTING SPRAY	The Clorox Company	USA	65.0% Ethyl alcohol (w/w) 0.63% Quaternary ammonium chloride	1 min. 3.2 3 min. >3.2 10 min. >3.2	0.2 0.5 1.4	4.7 4.8 4.8	5.3 5.2 5.2	5.0	3.4				
7. FD 320	Orochemie	Germany & Canada	42% 1-propanol (w/v) 10% Ethyl alcohol (w/v)	1 min. 0.0 3 min. 0.0 10 min. 0.3	0.0 0.0 0.0	5.4 5.4 >5.1	3.7 5.0 5.0			>5.6	4.7		
8. FD 322	Orochemie	Germany & Canada	32% 1-propanol (w/v) 26% Ethyl alcohol (w/v)	1 min. 0.0 3 min. 0.2 10 min. 0.7	0.0 0.0 0.0	5.7 >5.1 5.4	4.8 >4.7 >4.7			>4.9	4.3		
9. FORMAL SPRAY	Courtin	England	43.5% Ethyl alcohol (w/v) 19.6% 2-propanol (w/v) 4.0% 1-propanol (w/v)	1 min. 0.2 3 min. 0.6 10 min. 1.0	0.0 0.0 0.0	>5.1 5.4 >5.1	5.8 >5.5 >5.5			>5.9	3.3		
10. G ₂	Germiphene	Canada	70.5% Ethyl alcohol (w/w) 0.2% Chlorhexidine Gluconate (w/w)	1 min. 3.2 3 min. 3.2 10 min. 4.5	0.5 0.5 1.1	4.8 4.8 4.8	4.3 4.3 4.3	5.3	4.1				
11. GENERIC RUBBING ALCOHOL	Bergen Brunswig Drug	USA	70% Isopropyl alcohol (v/v)	1 min. 0.0 3 min. 0.0 10 min. 0.0	0.0 0.0 0.0	5.3 >5.0 >5.0	4.9 >4.6 >4.6	5.2	3.7				
12. GERMXTRA	Germiphene	Canada	79% Ethyl alcohol (w/w) 0.2% Quat. ammonium chloride (w/w) 0.1% Phenolic (w/w)	1 min. 4.3 3 min. 4.2 10 min. 4.2	1.8 3.4 >3.8	5.0 5.0 5.5	4.2 4.3 4.6			4.9	3.4		
13. GLEN 20	Reckitt Benckiser	Australia	68% Ethyl alcohol (w/w)	1 min. >5.3 3 min. 5.5 10 min. >5.5	3.7 >4.0 3.9	5.1 5.0 4.4	5.2 5.2 5.5			4.4	3.2		
14. LYSOL BRAND II DISINFECTANT SPRAY (Canadian)	Reckitt Benckiser	Canada	68% Ethyl alcohol (w/w)	1 min. >5.0 3 min. >5.0 10 min. >5.0	1.6 2.2 2.8	5.6 5.4 5.3	5.9 5.5 5.9			5.5	3.6		
15. LYSOL BRAND II I.C. DISINFECTANT SPRAY	Reckitt Benckiser	USA	79% Ethyl alcohol (w/w) 0.1% Quat. ammonium chloride (w/w)	1 min. 3.6 3 min. >3.6 10 min. >3.7	3.3 3.6 >3.9	>5.1 5.5 >5.1	>5.5 6.2 >5.5			5.7	5.6		
16. LYSOL BRAND III DISINFECTANT SPRAY (over the counter)	Reckitt Benckiser	USA	58% Ethyl alcohol (w/w) 0.1% Quat. ammonium chloride (w/w)	1 min. 4.1 3 min. >3.6 10 min. 3.8	1.0 2.8 3.1	5.1 5.0 >4.7	6.1 5.9 5.9			>5.6	6.4		
17. SURFEX-E	Microbex	Canada	70% Ethyl alcohol (w/w)	1 min. >4.4 3 min. >4.5 10 min. >4.5	0.3 1.6 1.8	>5.1 >5.1 >5.1	>5.2 5.4 >5.2			5.3	2.8		
18. T ⁶ DISINFECTANT	ALDA Pharmaceuticals	Canada	69.7% Ethyl alcohol (v/v) 0.28% o-phenylphenol (w/v) 0.20% Benzalkonium chloride (w/v)	1 min. 0.9 3 min. 2.8 10 min. 4.7	0.1 0.3 0.5	5.1 4.9 5.0	4.1 4.2 4.3			>5.0	4.0		
19. VIRAGUARD	Veridien	USA	70% Isopropyl alcohol (w/w)	1 min. 0.0 3 min. 0.0 10 min. 0.0	0.0 0.0 0.0	5.3 >5.3 5.0	>5.3 >5.3 >5.1			4.6	3.6		
CHLORINE-BASED													
NOTE: All Clorox tests included both the Household and Institutional brands. Results for both brands at the same dilutions were similar & were therefore combined in chart below.													
1-2. CLOROX 1:2 (Household & Institutional)	The Clorox Company	USA	2.63% Sodium hypochlorite	1 min. >5.2 3 min. >5.2 10 min. >5.2	>4.8 >4.8 >4.8	>5.8 >6.1 >6.1	>6.2 >6.2 >6.2			6.1	3.3		
3-4. CLOROX 1:5 (Household & Institutional)	The Clorox Company	USA	1.05% Sodium hypochlorite	1 min. >5.2 3 min. >5.4 10 min. >5.3	>4.5 >4.5 >4.5	>6.1 >6.1 >6.1	1.6 4.0 6.1			6.5	1.8		
5-6. CLOROX 1:10 (Household & Institutional)	The Clorox Company	USA	0.53% Sodium hypochlorite	1 min. >5.2 3 min. >5.2 10 min. >5.0	4.5 >4.6 >4.5	5.7 >6.2 >6.2	0.6 0.8 1.7			6.3	1.1		
7-8. CLOROX 1:100 (Household & Institutional)	The Clorox Company	USA	0.05% Sodium hypochlorite	1 min. >4.6 3 min. >4.4 10 min. >4.4	1.1 1.3 1.4	>5.2 >6.2 >6.2	0.5 1.0 1.6			2.7	0.1		
9. EXSPOR 4:1:1	Alcide	USA	0.26% Sodium chlorite	1 min. >5.2 3 min. >5.1 10 min. >5.2	>4.4 >4.3 >4.3	>6.0 >6.0 >6.0	>5.2 >6.2 >6.2			3.0	0.1		
10. XINIX Surface-Concentrate (3:50)	XINIX DTI	Sweden	1500 ppm Chlorine dioxide	1 min. 4.8 3 min. >4.7 10 min. >4.6	<0.2 <0.1 <0.1	>4.7 >4.7 >4.7	0.0 0.0 0.0			0.2	1.3		

* at left of product name indicates product passed all tests used by CRA.

OVER →

RED AREAS ON CHART INDICATE INADEQUATE KILL

Not tested	POLIO VIRUS I (Mahoney)		TUBERCULOSIS ORGANISM (<i>M. bovis</i>)	
	SUSPENSION TEST	SURFACE TEST	SUSPENSION TEST	SURFACE TEST

DISINFECTANT NAME	COMPANY	COUNTRY	MAJOR ACTIVE INGREDIENT(S)	TEST TIMES	WITHOUT BLOOD	WITH BLOOD	WITHOUT BLOOD	WITH BLOOD	WITHOUT BLOOD	WITH BLOOD
CHLORINE & BROMINE-BASED										
1. MICROSTAT 2	Septodont	USA	700-800 ppm Chloride & Bromide	1 min.	>4.0	3.1	4.5	0.0		
				3 min.	>4.1	3.3	5.2	0.0		
				10 min.	>4.1	3.3	5.2	0.0		
IODOPHORE-BASED										
1. IODOFIVE (1:213)	Certol International	USA	75 ppm Iodine	1 min.	0.3	0.0	1.8	0.0		
				3 min.	0.4	0.0	5.3	0.0	1.5	0.0
				10 min.	1.9	0.1	4.8	0.0		
2. WESCODYNE (1:213)	Steris Corporation	USA	75 ppm Iodine	1 min.	0.3	0.0	1.8	0.0		
				3 min.	0.4	0.0	5.3	0.0	1.5	0.0
				10 min.	1.9	0.1	4.8	0.0		
MISCELLANEOUS ACTIVE INGREDIENTS										
1. ECOTRU PROFESSIONAL	EnviroSystems, Inc.	USA	0.20% Parachlorometaxyleneol (w/v)	1 min.	0.1	0.0	0.3	0.9		
				3 min.	0.1	0.0	2.0	2.5	4.4	2.4
				10 min.	0.1	0.0	5.1	4.8		
2. LYSOL BRAND I.C. READY TO USE DISINFECTANT CLEANER	Reckitt Benckiser Professional	USA	2.50% Citric Acid	1 min.	>4.5	0.1	0.1	0.0		
				3 min.	4.9	0.0	0.1	0.1	1.5	1.2
				10 min.	>4.6	0.8	0.2	0.1		
3. Opt/M 33 TB	SciCan	Canada	0.5% Accelerated™ Hydrogen Peroxide (w/w)	1 min.	3.7	0.0	1.6	5.3		
				3 min.	>4.2	0.0	5.8	>6.0	>5.3	6.6
				10 min.	>3.6	0.0	>5.2	>6.0		
4. VIRKON (1% SOLUTION)	Antec International Ltd.	England	5% Potassium peroxomonosulphate 1.5% Sodium alkyl benzene sulphonate 0.5% Sulphamic acid	1 min.	4.5	0.0	0.8	0.4		
				3 min.	>4.9	0.5	0.8	0.4	1.6	0.3
				10 min.	>5.0	2.3	0.9	0.3		
PHENOLIC-BASED										
1. BIREX _{SE} (1:256)	Biotrol International	USA	0.03% o-phenylphenol 0.03% p-tertiary amylphenol	1 min.	4.1	0.3	0.2	0.0		
				3 min.	>4.7	0.3	3.0	0.0	2.9	0.3
				10 min.	>4.7	0.3	>5.1	0.0	1.1	0.2
2. LYSOL I.C. PHENOLIC HOSPITAL DISF/CLEANER (1:128)	Reckitt Benckiser Professional	USA	0.02% o-phenylphenol 0.06% o-benzyl-p-chlorophenol	1 min.	0.0	0.7	0.8	0.2		
				3 min.	0.0	0.6	4.5	2.2	3.3	1.1
				10 min.	0.0	0.7	>6.2	5.1	0.7	0.6
3. PROFESSIONAL AMPHYL DISINFECTANT CLEANER (1:200)	Reckitt Benckiser Professional	USA	0.05% o-phenylphenol 0.03% o-benzyl-p-chlorophenol	1 min.	0.0	0.9	2.9	0.1		
				3 min.	0.0	0.7	>5.1	1.0	2.7	0.7
				10 min.	0.0	0.7	>5.1	4.9	1.3	0.3
4. PROFESSIONAL AMPHYL HOSPITAL BULK DISF/CLEANER (3:100)	Reckitt Benckiser	USA	0.08% o-phenylphenol 0.08% o-benzyl-p-chlorophenol 0.65% Other misc. active ingredients	1 min.	0.0	0.2	1.4	0.0		
				3 min.	0.0	0.3	5.4	0.2	4.1	1.1
				10 min.	0.0	0.3	>5.1	0.9	4.6	0.9
5. PROSPRAY C-60 Not diluted	Certol International	USA	0.28% o-phenylphenol 0.03% o-benzyl-p-chlorophenol	1 min.	0.0	0.3	0.9	0.0		
				3 min.	0.0	0.4	5.4	0.4	3.6	0.9
				10 min.	0.0	0.6	>6.2	3.0	2.8	0.7
6. SPORICIDIN Not diluted	The Sporicidin Company	USA	1.56% Phenol 0.06% Sodium phenate	1 min.	0.0	0.2	2.5	2.2		
				3 min.	0.0	0.1	>5.2	4.2	>5.6	4.4
				10 min.	0.1	0.2	>5.2	5.8	5.7	5.0
QUATERNARY AMMONIUM-BASED										
1. BBJ SPRAY DISINFECTANT/CLEANER	BBJ Environmental Solutions, Inc.	USA	0.21% Quaternary ammonium chloride	1 min.	>4.1	0.0	0.0	0.1		
				3 min.	>4.2	0.0	0.1	0.2	2.4	2.7
				10 min.	>4.0	0.0	0.2	0.5		
2. CAVICIDE	Metrex Research	USA	0.28% Quaternary ammonium chloride 17.2% Isopropyl alcohol (w/w)	1 min.	3.5	0.0	1.0	1.9		
				3 min.	>3.8	0.1	1.9	2.4	1.7	2.4
				10 min.	>3.9	0.1	4.3	4.4		
3. LYSOL I.C. FOAMING DISF/CLEANER Not diluted	Reckitt Benckiser	USA	0.1% Quaternary ammonium chloride	1 min.	>4.8	0.3	0.1	0.0		
				3 min.	>4.7	0.5	0.2	0.1	2.3	2.4
				10 min.	>4.7	1.0	0.6	0.7		
4. MADACIDE-FD	Mada Medical Products	USA	0.308% Quaternary ammonium chloride 21.0% Isopropyl alcohol (v/v)	1 min.	0.0	0.0	1.6	1.9		
				3 min.	0.1	0.0	2.9	3.2	4.0	4.6
				10 min.	0.1	0.0	5.2	4.6		
5. STERASEPTIC 256 (1:256)	Asepsis International	USA	0.06% Quaternary ammonium chloride	1 min.	0.0	0.0	0.0	0.0		
				3 min.	0.9	0.0	0.0	0.0	0.9	0.3
				10 min.	0.0	0.0	0.0	0.0		
6. SUV (1:64)	OSHA Review	USA	0.07% Quaternary ammonium chloride	1 min.	5.0	0.0	0.0	0.0		
				3 min.	5.0	0.1	0.1	0.0	0.5	0.1
				10 min.	5.0	0.1	0.1	0.2		
WIPES										
1. DISCIDE ULTRA Pre-wetted	Palmero Healthcare	USA	0.24% Quaternary ammonium chloride 63.25% Isopropyl alcohol (w/w)	1 min.	0.0	0.0	3.3	4.0		
				3 min.	0.0	0.1	5.2	5.1	4.1	1.2
				10 min.	0.0	0.1	>4.4	5.1		
2. SPORICIDIN TOWELETTE Pre-wetted	The Sporicidin Company	USA	1.56% Phenol 0.06% Sodium phenate	1 min.	0.0	0.1	0.4	0.2		
				3 min.	0.0	0.0	1.4	1.0	4.1	1.1
				10 min.	0.7	0.0	4.9	3.9		
3. SUPER SANI-CLOTH Pre-wetted	Nice-Pak PDI	USA	0.5% Quaternary ammonium chloride 55% Isopropyl alcohol (w/w)	1 min.	0.0	0.3	3.4	3.3		
				3 min.	0.1	0.1	5.3	4.4	4.9	3.2
				10 min.	0.0	0.1	5.1	4.4		
4. VIRAGUARD TOWELETES Pre-wetted	Veridien	USA	70% Isopropyl alcohol (w/w)	1 min.	0.0	0.1	4.7	4.5		
				3 min.	0.0	0.0	4.7	4.7	1.6	0.1
				10 min.	0.1	0.0	4.9	4.7		

CRA CONCLUSIONS: Of 52 disinfectants tested & listed above, only 4 passed all tests used by CRA, & were either ethyl alcohol or chlorine-based. Inability to inactivate a resistant virus was the most prevalent lack. These data can be helpful when selecting an environmental surface disinfectant for clinical use.