

Multi-Microbial Time Challenge Studies

Anti-microbial Activities of Di-Dak-Sol™

(Does Di-Dak-Sol destroy MRSA?)

Purpose of Study

The purpose of this study was to determine how quickly **Di-Dak-Sol™** would kill MRSA, VRE, and 6 other microorganisms commonly found in wounds. To avoid bias, we hired two separate outside laboratories to perform the tests. (**Di-Dak-Sol™** is a diluted form of Dakin's Solution, so if **Di-Dak-Sol™** killed the bacteria we can assume that Dakin's would also.)

Double Blind Randomized Testing: Two independent third party laboratories performed the Multi-Microbial Time Challenge Studies, according to Century's protocol.

Method

For purposes of the tests, two different batches of **Di-Dak-Sol™** (Sodium Hypochlorite 0.0125%) were randomly selected. One of the batches of **Di-Dak-Sol™** tested was near its expiration date. This batch was chosen to make sure **Di-Dak-Sol™** would kill MRSA, even if the **Di-Dak-Sol™** was close to expiring.

Both samples "A" and "B" were sent to third party laboratories for Multi-Microbial Time Challenge Studies.

The first laboratory exposed several types of bacteria to **Di-Dak-Sol™** for 15, 30 and 60 minutes. These times were selected because usually **Di-Dak-Sol™** is used as the wetting agent for a wet to moist dressing, and is kept on the wound for more than 30 minutes.

The second laboratory, in addition to the tests above, exposed MRSA and VRE to **Di-Dak-Sol™** for 30 seconds. This was to show that these two resistant bacteria, commonly found in wounds, were killed when they were exposed to **Di-Dak-Sol™**.

Results

Both MRSA and VRE were killed in a short period of time, even when extremely high concentrations of these resistant bacteria were present.

The log reduction column shows the difference between the beginning concentration and the ending concentration. A Log Reduction of ">8" shows that 10 times the bacteria was killed compared to a Log Reduction of ">7".

MRSA – Methicillin Resistant *Staphylococcus aureus*

VRE – Vancomycin Resistant *Enterococcus faecalis*

Sample "A" 30 seconds	Microorganism Tested	Beginning Concentration	Ending Concentration	Log Reduction
	<i>MRSA ATCC BAA-38</i>	$1.94 * 10^8$	$<1 * 10^0$	>8
	<i>VRE ATCC 700221</i>	$1.9 * 10^7$	$<1 * 10^0$	>7

	<i>Pseudomonas aeruginosa ATCC 9027</i>	$1.5 * 10^8$	$<1 * 10^0$	>8
	<i>Proteus mirabilis ATCC 14153</i>	$8.1 * 10^7$	$<1 * 10^0$	>8
	<i>Escherichia coli ATCC 11775</i>	$7.7 * 10^7$	$<1 * 10^0$	>8

Sample "A" 15 minutes	<i>Serratia marcescens</i> ATCC 13477	$1.01 * 10^8$	$<1 * 10^0$	>8
	MRSA ATCC BAA-38	$3.2 * 10^7$	$<1 * 10^0$	>7
	VRE ATCC 700221	$1.8 * 10^7$	$<1 * 10^0$	>7
	<i>Aspergillus niger</i> ATCC16404	$8.2 * 10^6$	$7 * 10^0$	>6
	<i>Candida albicans</i> ATCC10231	$7.9 * 10^5$	$<1 * 10^0$	>6

Sample "A" 30 minutes	<i>Pseudomonas aeruginosa</i> ATCC 9027	$4.8 * 10^7$	$<1 * 10^0$	>7
	<i>Proteus mirabilis</i> ATCC 14153	$3 * 10^8$	$<1 * 10^0$	>8
	<i>Escherichia coli</i> ATCC 11775	$3.88 * 10^8$	$<1 * 10^0$	>8
	<i>Serratia marcescens</i> ATCC 13477	$4.27 * 10^8$	$<1 * 10^0$	>8
	MRSA ATCC BAA-38	$1.94 * 10^8$	$<1 * 10^0$	>8
	VRE ATCC 700221	$1.9 * 10^7$	$<1 * 10^0$	>7

	<i>Aspergillus niger</i> ATCC16404	$4.3 * 10^7$	$7 * 10^0$	>6
	<i>Candida albicans</i> ATCC10231	$4.7 * 10^6$	$<1 * 10^0$	>6

Sample "A" 60 minutes	<i>Pseudomonas aeruginosa</i> ATCC 9027	$4.8 * 10^7$	$<1 * 10^0$	>7
	<i>Proteus mirabilis</i> ATCC 14153	$3 * 10^8$	$<1 * 10^0$	>8
	<i>Escherichia coli</i> ATCC 11775	$3.88 * 10^8$	$<1 * 10^0$	>8
	<i>Serratia marcescens</i> ATCC 13477	$4.27 * 10^8$	$<1 * 10^0$	>8
	MRSA ATCC BAA-38	$1.94 * 10^8$	$<1 * 10^0$	>8
	VRE ATCC 700221	$1.9 * 10^7$	$<1 * 10^0$	>7
	<i>Aspergillus niger</i> ATCC16404	$4.3 * 10^7$	$<1 * 10^0$	>7
	<i>Candida albicans</i> ATCC10231	$4.7 * 10^6$	$<1 * 10^0$	>6

	<i>Pseudomonas aeruginosa</i> ATCC 9027	$1.5 * 10^8$	$<1 * 10^0$	>8
--	---	--------------	-------------	----

Sample "B" 15 minutes	<i>Proteus mirabilis</i> ATCC 14153	$8.1 * 10^7$	$<1 * 10^0$	>8
	<i>Escherichia coli</i> ATCC 11775	$7.7 * 10^7$	$<1 * 10^0$	>8
	<i>Serratia marcescens</i> ATCC 13477	$1.01 * 10^8$	$<1 * 10^0$	>8
	MRSA ATCC BAA-38	$3.2 * 10^7$	$<1 * 10^0$	>7
	VRE ATCC 700221	$1.8 * 10^7$	$<1 * 10^0$	>7
	<i>Aspergillus niger</i> ATCC16404	$8.2 * 10^6$	$7 * 10^0$	>6
	<i>Candida albicans</i> ATCC10231	$7.9 * 10^5$	$<1 * 10^0$	>6

Sample "B"	<i>Pseudomonas aeruginosa</i> ATCC 9027	$4.8 * 10^7$	$<1 * 10^0$	>7
	<i>Proteus mirabilis</i> ATCC 14153	$3 * 10^8$	$<1 * 10^0$	>8
	<i>Escherichia coli</i> ATCC 11775	$3.88 * 10^8$	$<1 * 10^0$	>8
	<i>Serratia marcescens</i> ATCC 13477	$4.27 * 10^8$	$<1 * 10^0$	>8

30 minutes	<i>MRSA ATCC BAA-38</i>	$1.94 * 10^8$	$<1 * 10^0$	>8
	<i>VRE ATCC 700221</i>	$1.9 * 10^7$	$<1 * 10^0$	>7
	<i>Aspergillus niger ATCC16404</i>	$4.3 * 10^7$	$3 * 10^0$	>7
	<i>Candida albicans ATCC10231</i>	$4.7 * 10^6$	$<1 * 10^0$	>6

Sample "B" 60 minutes	<i>Pseudomonas aeruginosa ATCC 9027</i>	$4.8 * 10^7$	$<1 * 10^0$	>7
	<i>Proteus mirabilis ATCC 14153</i>	$3 * 10^8$	$<1 * 10^0$	>8
	<i>Escherichia coli ATCC 11775</i>	$3.88 * 10^8$	$<1 * 10^0$	>8
	<i>Serratia marcescens ATCC 13477</i>	$4.27 * 10^8$	$<1 * 10^0$	>8
	<i>MRSA ATCC BAA-38</i>	$1.94 * 10^8$	$<1 * 10^0$	>8
	<i>VRE ATCC 700221</i>	$1.9 * 10^7$	$<1 * 10^0$	>7
	<i>Aspergillus niger ATCC16404</i>	$4.3 * 10^7$	$3 * 10^0$	>7

	<i>Candida albicans</i> ATCC10231	$4.7 * 10^6$	$<1 * 10^0$	>6
--	-----------------------------------	--------------	-------------	------