MDL
THE GERM EXPERTS
MICROBIAL DEFENSE LABORATORIES

Efficacy Reporting

3 Hospital Independent Study

MICROBAC®
MicroBioTest Division

CHESTNUTLABS

HISTORY- MICROBIAL DEFENSE LABORATORIES

MDL is an innovative and resourceful company that is dedicated to reducing, controlling and stopping the adverse effects of microbes found on surfaces. RAZOR™ Antimicrobial Coating is a cutting edge Residual Nano-Technology that protects surfaces from microbial growth and has undergone extensive laboratory efficacy testing with proven results.

Surface protection is the most controllable way to prevent cross contamination. This document will provide an overview of how RAZOR™ Antimicrobial Coating works and real world Hospital surface testing results. The independent laboratory testing validates the extensive laboratory efficacy testing and EPA registration of RAZOR™ Antimicrobial Coating.

Testing and analysis plays a key role in evaluating the effectiveness of Antimicrobials and Surface Protectants as well as determining the application techniques and frequencies.

Rigorous testing by both independent and World Health Organizations approved laboratories confirms that RAZOR™ Antimicrobial Coating has been proven to reduce the growth of microbe populations on surfaces by up to 99.99% and will continues to inhibit their return for months!

RAZOR™ Antimicrobial Coating has also had positive results for almost a decade in many industries that include: Child care, Independent School Districts, Elite Military Divisions, Professional Sports Teams, Medical, Food Processing, Restaurants, Retirement Communities, Office Buildings and many more.

MDL has partnered with the best, most innovative technology companies in the world in order to implement the best application techniques and determine the optimal application frequencies for RAZOR™ Antimicrobial Coating.

DIS.IN.FX® is an infection prevention plan innovator that utilizes RAZOR™ Antimicrobial Coating in their proactive Antimicrobial programs. Emist Innovations Inc. has developed battery operated electrostatic fogging and misting applicators. Hygiena is the leader in instant microbial testing devices and has

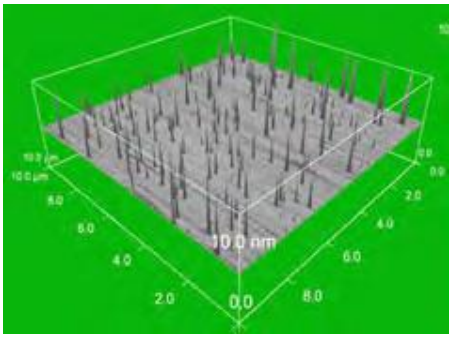
been instrumental in the development of infection prevention programs for RAZOR™ Antimicrobial Coating.

HOW IT WORKS- RAZOR™ Antimicrobial Coating Nano-Technology

RAZOR™ Antimicrobial Coating prevents the growth of a wide array of bacteria, mold, mildew, algae, and yeast. The Antimicrobial Coating acts like a bed of microscopic spikes that pierce the cell walls of microbes offering a totally new approach to providing long lasting Antimicrobial protection.

The silane base at one end of the Antimicrobial Molecule creates a strong bond with the surface of the substrate, both porous and non-porous, forming a highly durable protective coating. The other end of the Molecule forms a microscopic bed of spikes that puncture microbes like a 'bed of nails'. The Antimicrobial Coating methodology uses a mechanical process through a positively charged polymer. This polymer combines the physical puncture of a microbe's cell wall along with a positive electrical charge that 'electrocutes' the microbe.

Traditional disinfectants use a leaching or poisoning process and once dry they become ineffective. They are also able to leach into and harm the environment. Another benefit to a mechanical process is that the Antimicrobial Coating has been proven not to create "super-bugs" that build up resistance to treatments.



Microscopic view of spikes

Over 30 years of research and development have gone into the creation of RAZOR™ Antimicrobial Coating. The Nano-Technology has undergone extensive laboratory testing and has a long history of safe use.

RAZOR™ Antimicrobial Coating is similar to the technology found in Rain-X or Scotchguard. All of these products are polymers that are long lasting, but degrade over time due to friction and use. Reapplication is necessary but not at the same rate as traditional disinfectants.

TESTING- Independent Lab Testing

Recently, testing was conducted on RAZOR™ Antimicrobial Coating for the largest hospital environmental services company in the United States in order to verify the performance of the Microbiostatic Antimicrobial Coating in a hospital setting.

Independent laboratory tests were ordered to confirm the EPA approved claims. The testing was performed by two different independent laboratories at three different hospital locations across the country selected by the hospital environmental services company.

Microbac Laboratories Inc., an independent testing facility, conducted the testing for Hospital 1, located in Louisville, Kentucky, and Hospital 2 located in Columbus, Ohio. Chestnut Labs, also an independent testing facility, conducted the testing for Hospital 3 located in Joplin, Missouri. Two to three areas in each hospital including public areas such as the emergency room waiting area and inpatient rooms were evaluated with 3 to 19 points selected in each room. Swab tests were performed every 15 days over a three month period. Each test was monitored by the environmental Supervisor of the facility being tested. The swabs were categorized, put on ice and taken to the independent labs to determine the results.

The Hospitals

Hospital 1

Hospital 1 is a teaching hospital located near downtown Louisville, Kentucky. The hospital's emergency room is one of the largest trauma facilities in the country and is able to accommodate up to 86 patients simultaneously. The center is staffed 24-hours a day and sees more than 2,400 patents each year, 40 percent of those are referred from other hospitals throughout the region.

Hospital 2

As one of the largest and most comprehensive hospitals and institutes in the United States, Hospital 2 is home to the department of pediatrics for a local university medical school. In a typical year, the hospital sees patients from across the country and around the world. Hospital 2 is located in Columbus, Ohio and maintains a medical staff of approximately 950, a hospital staff of 6,800, and delivers pediatric care for almost 823,000 patient visits annually.

Hospital 3

Hospital 3, located in Joplin, Missouri, is also a teaching hospital and features a 404-bed, three hospital system, which includes a comprehensive behavioral health center. The facility has recently completed a $47 million expansion project. Hospital 3 is a member of the Oklahoma Osteopathic Medical Consortium of Oklahoma and the regional Osteopathic Postdoctoral Training Institution and an affiliate of Oklahoma State University-College of Medicine.

THE RESULTS- Hospital 1

As demonstrated on the following certified reports from Microbac Laboratories, a significant microbial decrease was found in all areas treated and tested at Hospital 1. The average decrease in harmful bacteria and microbes for the three rooms treated and tested at Hospital 1 was 97.85 percent!

Microbac

Microbac Laboratories, Inc.
Kentucky Testing Laboratory Division
3323 Gilmore Industrial Boulevard Louisville, KY 40213
502/962-6400 Fax: 502/962-6411

[redacted] Louisville, Kentucky, Treated Room, Emergency Room Waiting Area

Sample Number	Sample Description	Baseline 1/26/2010	Follow-up 2/10/2010	Follow-up 3/1/2010	Follow-up 3/15/2010	Follow-up 4/5/2010	Follow-up 4/22/2010	Follow-up 5/12/2010
001	ER Chair 1, Arms / Seat	980	30	70	<10	<10	80	<10
002	ER Chair 2, Fabirc Only	2500	10	380 (1)	47000 (2)	41600	50	90
003	Soda Machine, Keypad	290	<10	30	36000 (2)	50	10	<10
004								
005								
006								
007								
008								
009								
010								
011								
012								
013								
014								

THIS REPORT HAS BEEN REVIEWED AND APPROVED FOR RELEASE
(1) Upon arrival, patient was sitting in chair
(2) ER Waiting Area very active

Kenneth W. Ford, Director

The results shown above are from the Emergency Room Waiting Area of Hospital 1 and show a significant decrease in microbes when compared to the baseline sample. Swab tests were conducted every 15 days from January 2010 to May 2010 on three surfaces including 2 chairs and the vending machine keypad. The total decrease in microbes from the baseline test to the last follow-up test was 97.13 percent.

Microbac

Microbac Laboratories, Inc.

Kentucky Testing Laboratory Division
3323 Gilmore Industrial Boulevard Louisville, KY 40213
502/962-6400 Fax: 502/962-6411

[redacted] Louisville, Kentucky, Treated Room Floor 5, Room 4

Sample Number	Sample Description	Baseline 1/26/2010	Follow-up 2/10/2010	Follow-up 3/1/2010	Follow-up 3/15/2010	Follow-up 4/5/2010	Follow-up 4/22/2010	Follow-up 5/12/2010
001	TV Remote	990	10	10	10	380	340	10
002	Middle Wall Panel	1600	10	<10	<10	<10	10	10
003	Arm Rest of Chair	270	10	<10	<10	<10	40	(1)
004	Blood Pressure Bulb	130	20	<10	30	<10	40	<10
005	Night Light Switch	100	<10	10	<10	<10	20	<10
006	Counter Under Lip	70	<10	30	<10	<10	<10	<10
007	Drawer Handles	70	<10	<10	<10	<10	20	<10
008	Thermometer Blue Tip	60	<10	<10	<10	<10	20	(2)
009								
010								
011								
012								
013								
014								

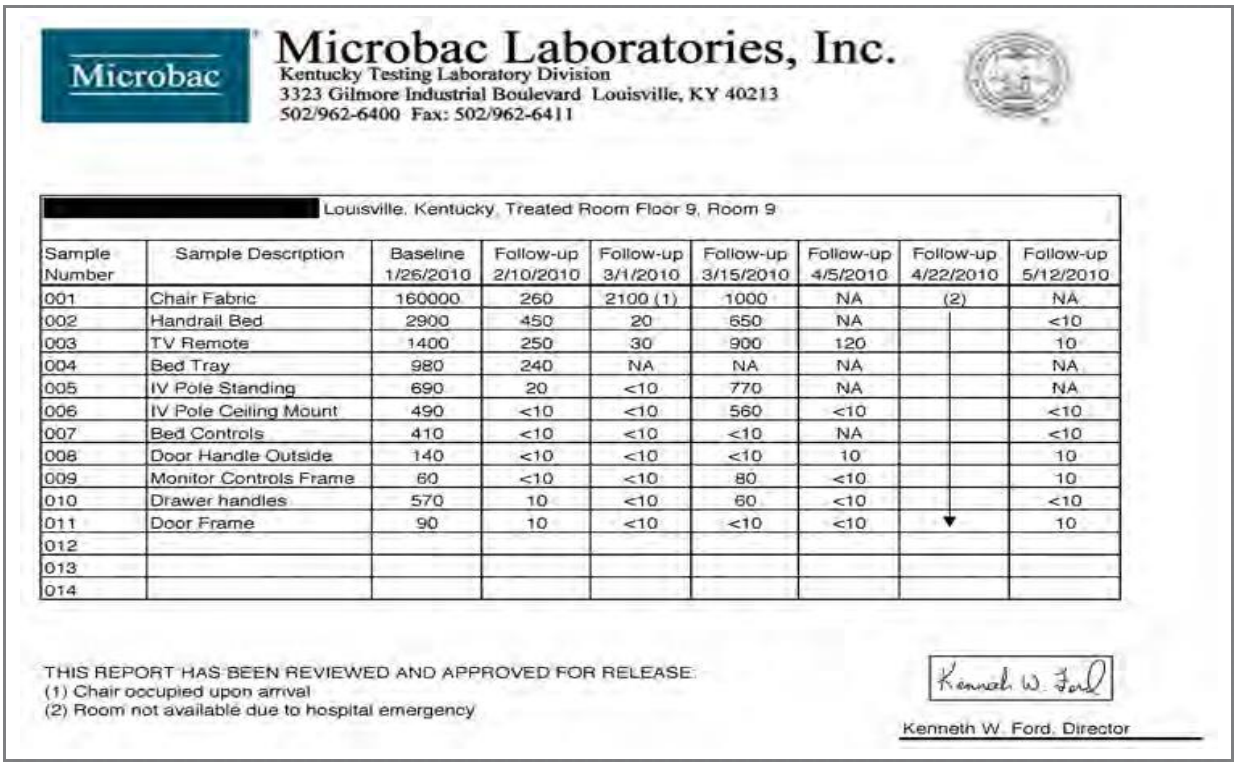
(1) Chair not present in room
(2) Thermometer not present in room

Kenneth W. Ford

THIS REPORT HAS BEEN REVIEWED AND APPROVED FOR RELEASE

Kenneth W. Ford, Director

The results shown above are from Room 4 on the 5th floor of Hospital 1 and also show a significant decline in microbes when compared to the baseline sample. Swab tests were conducted every 15 days from January 2010 to May 2010 on eight surfaces including the television, remote, chair, blood pressure bulb, the switch for night light, drawer handles, thermometer, wall panel, and underside of the counter lip. The decrease in microbes for this room was an astounding 99.95 percent.



Microbac Laboratories, Inc.
Kentucky Testing Laboratory Division
3323 Gilmore Industrial Boulevard Louisville, KY 40213
502/962-6400 Fax: 502/962-6411

[redacted] Louisville, Kentucky, Treated Room Floor 9, Room 9

Sample Number	Sample Description	Baseline 1/26/2010	Follow-up 2/10/2010	Follow-up 3/1/2010	Follow-up 3/15/2010	Follow-up 4/5/2010	Follow-up 4/22/2010	Follow-up 5/12/2010
001	Chair Fabric	160000	260	2100 (1)	1000	NA	(2)	NA
002	Handrail Bed	2900	450	20	550	NA		<10
003	TV Remote	1400	250	30	900	120		10
004	Bed Tray	980	240	NA	NA	NA		NA
005	IV Pole Standing	690	20	<10	770	NA		NA
006	IV Pole Ceiling Mount	490	<10	<10	560	<10		<10
007	Bed Controls	410	<10	<10	<10	NA		<10
008	Door Handle Outside	140	<10	<10	<10	10		10
009	Monitor Controls Frame	60	<10	<10	80	<10		10
010	Drawer handles	570	10	<10	60	<10		<10
011	Door Frame	90	10	<10	<10	<10		10
012								
013								
014								

THIS REPORT HAS BEEN REVIEWED AND APPROVED FOR RELEASE:
(1) Chair occupied upon arrival
(2) Room not available due to hospital emergency

Kenneth W. Ford, Director

The Results shown above from room 9 on the 9th floor of Hospital 1 continue to show a significant decrease in microbes when compared to the baseline sample. Swab tests were conducted every 15 days from January 2010 to May 2010 on 11 surfaces including the TV remote, chair, drawer handles, bed handrail, controls and TV tray, IV equipment, outside door handle and frame as well as the frame for the monitor controls. The decrease in microbes for this room was 96.47 percent.

	Baseline	Last Follow-Up	Total % Decrease
Emergency Room Waiting Area	3770	108	97.13%
Floor 5, Room 4	3290	116	96.47%
Floor 9, Room 9	167730	76	99.95%

The Chart above outlines the data for the baseline and final follow-up testing as well as the total percentage of decrease in microbes for each room tested in Hospital 1.

THE RESULTS- Hospital 2

As demonstrated on the following certified reports from Microbac Laboratories, a significant microbial decrease was found in all areas treated and tested at Hospital 2. The average decrease in harmful bacteria and microbes for the two rooms treated and tested at Hospital 2 was 68.44 percent. This result is lower than generally found in Hospitals 1 and 3. The difference is explained by the notes on the Microbac Results Certificate. Microbac determined the baseline data presented by the previous laboratory was invalid due to poor quality standards. Therefore, calculations for percentages of decrease were compiled using the first follow-up rather than the baseline.

Microbac

Microbac Laboratories, Inc.
Kentucky Testing Laboratory Division
3323 Gilmore Industrial Boulevard Louisville, KY 40213
502/962-6400 Fax: 502/962-6411

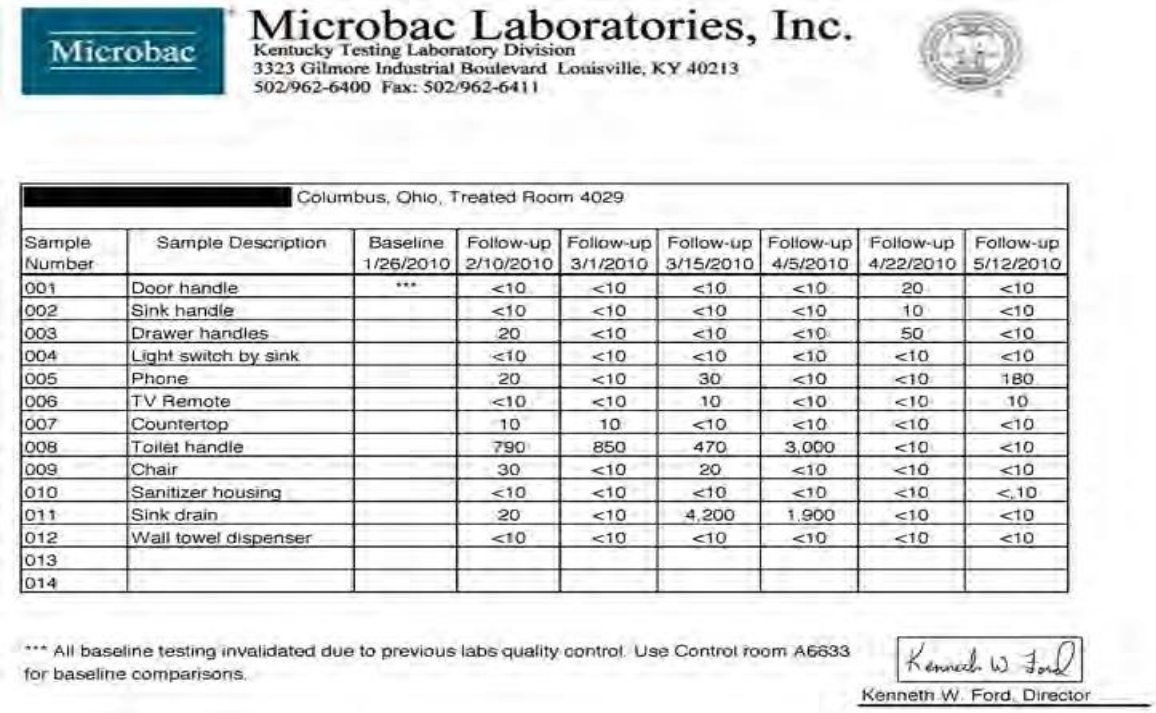
[redacted] Columbus, Ohio, Treated Room 4009

Sample Number	Sample Description	Baseline 1/26/2010	Follow-up 2/10/2010	Follow-up 3/1/2010	Follow-up 3/15/2010	Follow-up 4/5/2010	Follow-up 4/22/2010	Follow-up 5/12/2010
001	Sink handle	***	200	4000	60	<10	<10	<10
002	Telephone		<10	<10	70	<10	<10	<10
003	Wall by Towel Dispenser		<10	10	<10	<10	<10	<10
004	Drawer handles		20	<10	<10	<10	<10	20
005	Chair		<10	30	1200	<10	(1)	10
006	Entry Door Handle Outside		<10	<10	<10	<10	20	<10
007	Sink Drain		30	3400	4400	<10	<10	<10
008	Light switch		<10	20	<10	<10	<10	<10
009	Sanitizer Housing by Sink		30	<10	10	<10	<10	<10
010	Black Spotlight Handles		<10	<10	<10	<10	<10	<10
011	VCR / Radio / CD Controls		<10	<10	20	<10	<10	<10
012	Thermostat		90	10	150	<10	(2)	10
013	Bottom of Towel Dispenser		<10	<10	<10	<10	<10	<10
014	Door Frame		<10	<10	380	<10	<10	<10
015	Wall Area at Bottom of Bed		30	10	<10	<10	40	<10
016	TV Remote		<10	<10	50	<10	10	<10
017	Nurses Call Button on Wall		<10	10	<10	<10	60	10

*** All baseline testing invalidated due to previous labs quality control. Use Control room A6633 for baseline comparisons.
(1) Chair removed from room
(2) Thermostat not accessible due to patient positioning
THIS REPORT HAS BEEN REVIEWED AND APPROVED FOR RELEASE:

Kenneth W. Ford, Director

The results shown above from room 4009 at Hospital 2 show a significant decrease in microbes. Swab tests were conducted every 15 days from January 2010 to May 2010 on 17 surfaces including the sink handle and drain, telephone, walls, drawer handles, chair, light switch, DVD/Radio/CD controls, door frame, television remote, and nurse call button. The percentage of decrease in microbes from the first follow-up to the last follow-up test was 66.53 percent.



Microbac Laboratories, Inc.
Kentucky Testing Laboratory Division
3323 Gilmore Industrial Boulevard Louisville, KY 40213
502/962-6400 Fax: 502/962-6411

[redacted] Columbus, Ohio, Treated Room 4029

Sample Number	Sample Description	Baseline 1/26/2010	Follow-up 2/10/2010	Follow-up 3/1/2010	Follow-up 3/15/2010	Follow-up 4/5/2010	Follow-up 4/22/2010	Follow-up 5/12/2010
001	Door handle	***	<10	<10	<10	<10	20	<10
002	Sink handle		<10	<10	<10	<10	10	<10
003	Drawer handles		20	<10	<10	<10	50	<10
004	Light switch by sink		<10	<10	<10	<10	<10	<10
005	Phone		20	<10	30	<10	<10	180
006	TV Remote		<10	<10	10	<10	<10	10
007	Countertop		10	10	<10	<10	<10	<10
008	Toilet handle		790	850	470	3,000	<10	<10
009	Chair		30	<10	20	<10	<10	<10
010	Sanitizer housing		<10	<10	<10	<10	<10	<10
011	Sink drain		20	<10	4,200	1,900	<10	<10
012	Wall towel dispenser		<10	<10	<10	<10	<10	<10
013								
014								

*** All baseline testing invalidated due to previous labs quality control. Use Control room A6633 for baseline comparisons.

Kenneth W. Ford, Director

The results shown above from room 4029 at Hospital 2 show a significant decrease in microbes. Swab tests were conducted every 15 days from January 2010 to May 2010 on 14 surfaces including the sink handle and drain, door handles, light switch, phone, toilet handle, television remote, chair, drawer handles, countertop and wall towel dispenser. The percentage of decrease in microbes from the first follow-up to the last follow-up test was 70.34 percent.

Room	First Follow-Up	Last Follow-Up	Total % Decrease
Room 4009	499	167	66.53%
Room 4029	944	280	70.34%

The chart above outlines the data for the first and last follow-up testing as well as the total percentage of decrease in microbes for each room tested in Hospital 2.

The Results – Hospital 3

As demonstrated on the following certified reports from Chestnut Labs, a significant microbial decrease was found in all areas treated and tested at Hospital 3. In fact, the average decrease in harmful bacteria and microbes for the 2 rooms tested at Hospital 3 was and astounding 99.84 percent!

CHESTNUT LABS
PROTECTING FOOD SAFETY

3233 E. Chestnut Expressway • Springfield, MO 65802 • Tel: 417-829-3788 • Fax: 417-829-3787 • website: www.chestnutlabs.com

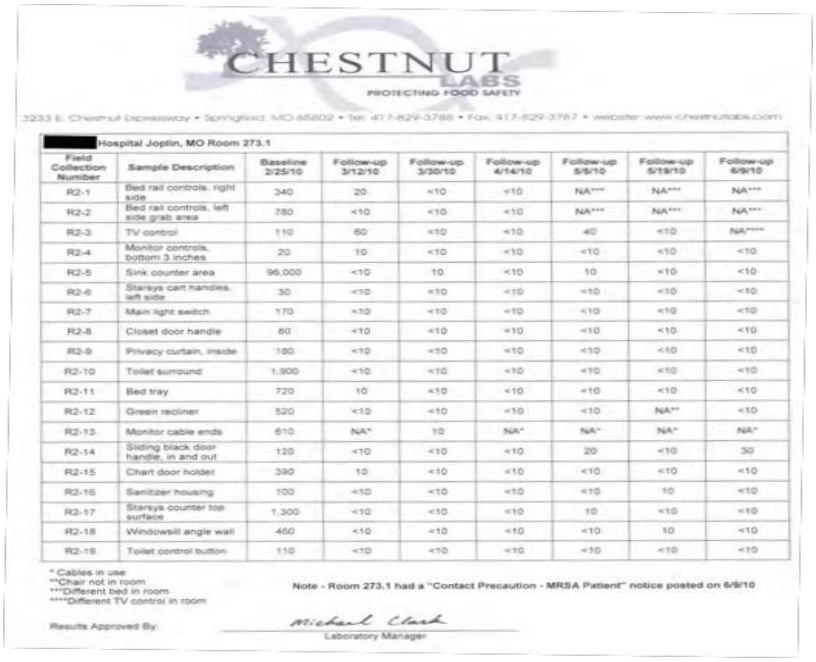
[redacted] Hospital Joplin, MO Room 272.1

Field Collection Number	Sample Description	Baseline 2/25/10	Follow-up 3/12/10	Follow-up 3/30/10	Follow-up 4/14/10	Follow-up 5/5/10	Follow-up 5/19/10	Follow-up 6/9/10
1-1	Bed rail controls, right side	490	<10	<10	<10	NA***	10	NA***
R1-2	Bed rail controls, left side grab area	380	<10	10	<10	NA***	<10	NA***
R1-3	TV control	120	<10	<10	<10	<10	<10	30
R1-4	Monitor controls, bottom 3 inches	30	<10	<10	<10	<10	20	<10
R1-5	Sink counter area	190,000	<10	<10	<10	<10	<10	<10
R1-6	Stansys cart handles, left side	150	<10	<10	<10	10	<10	<10
R1-7	Main light switch	50	<10	<10	10	<10	<10	<10
R1-8	Closet door handle	230	<10	<10	<10	<10	<10	<10
R1-9	Privacy curtain, inside	3,100	<10	10	<10	<10	<10	<10
R1-10	Toilet surround	1,700	<10	<10	<10	<10	<10	<10
R1-11	Bed tray	2,900	<10	<10	<10	<10	<10	10
R1-12	Gray chair, fabric/armrests	900	NA**	10	20	<10	110	NA**
R1-13	Monitor cable ends	340	NA*	NA*	NA*	NA*	NA*	NA*
R1-14	Sliding black door handle, in and out	120	<10	<10	<10	<10	<10	<10
R1-15	Chart door holder	340	<10	<10	<10	<10	<10	<10
R1-16	Sanitizer housing	210	<10	<10	<10	<10	<10	<10
R1-17	Stansys counter top surface	4,800	<10	<10	<10	10	<10	<10
R1-18	Windowsill angle wall	260	<10	<10	<10	<10	<10	<10
R1-19	Toilet control button	50	<10	<10	<10	<10	<10	<10

* Cables in use
**Chair not in room
***Different bed in room

Results Approved By: Michael Clark
Laboratory Manager

The results shown above from room 272 at Hospital 3 show a significant decrease in microbes. Swab tests were conducted every 15 days from February 2010 to June 2010 on 19 surfaces including the bed rail controls, television control, sink counter, monitor controls, light switch, closet door handle, privacy curtain, toilet surround and handle, chair, bed tray, sliding door handle, chart holder, and window sill. The microbes in this room deceased by 99.87 percent!



CHESTNUT LABS
PROTECTING FOOD SAFETY

[redacted] Hospital Joplin, MO Room 273.1

Field Collection Number	Sample Description	Baseline 2/25/10	Follow-up 3/12/10	Follow-up 3/30/10	Follow-up 4/14/10	Follow-up 5/5/10	Follow-up 5/19/10	Follow-up 6/9/10
R2-1	Bed rail controls, right side	340	20	<10	<10	NA***	NA***	NA***
R2-2	Bed rail controls, left side grab area	780	<10	<10	<10	NA***	NA***	NA***
R2-3	TV control	110	60	<10	<10	40	<10	NA****
R2-4	Monitor controls, bottom 3 inches	20	10	<10	<10	<10	<10	<10
R2-5	Sink counter area	96,000	<10	10	<10	10	<10	<10
R2-6	Starsys cart handles, left side	30	<10	<10	<10	<10	<10	<10
R2-7	Main light switch	170	<10	<10	<10	<10	<10	<10
R2-8	Closet door handle	80	<10	<10	<10	<10	<10	<10
R2-9	Privacy curtain, inside	180	<10	<10	<10	<10	<10	<10
R2-10	Toilet surround	1,900	<10	<10	<10	<10	<10	<10
R2-11	Bed tray	720	10	<10	<10	<10	<10	<10
R2-12	Green recliner	520	<10	<10	<10	<10	NA**	<10
R2-13	Monitor cable ends	610	NA*	10	NA*	NA*	NA*	NA*
R2-14	Sliding black door handle, in and out	120	<10	<10	<10	20	<10	30
R2-15	Chart door holder	390	10	<10	<10	<10	<10	<10
R2-16	Sanitizer housing	100	<10	<10	<10	<10	10	<10
R2-17	Starsys counter top surface	1,300	<10	<10	<10	10	<10	<10
R2-18	Windowsill angle wall	460	<10	<10	<10	<10	10	<10
R2-19	Toilet control button	110	<10	<10	<10	<10	<10	<10

* Cables in use
**Chair not in room
***Different bed in room
****Different TV control in room

Note - Room 273.1 had a "Contact Precaution - MRSA Patient" notice posted on 6/9/10

Results Approved By: Michael Clark
Laboratory Manager

The results shown above from room 273 at Hospital 3 also show a significant decrease in microbes. Once again, swab tests were conducted every 15 days from February 2010 to June 2010 on 19 surfaces including the bed rail controls, television control, sink counter, monitor controls, light switch, closet door handle, privacy curtain, toilet surround and handle, chair, bed tray, sliding door handle, chart holder, and windowsill. The microbes in this room decreased by 99.81 percent!

Room	Baseline	Last Follow-Up	Total % Decrease
Room 272	205830	277	99.87%
Room 273	103940	193	99.81%

The chart above outlines the data for the baseline and final follow-up testing as well as the total percentage of decrease in microbes for each room tested in Hospital 3.

Final Conclusions

All Antimicrobials are not created equal. It is important to understand the basic chemical, physical, and biological properties of an Antimicrobial so the best choice can be made. Because of its unique mode of action and inability to migrate from a treated surface, RAZOR™ Antimicrobial Coating's Nano-Technology is the obvious choice to minimize environmental contamination and the development of resistant organisms.

RAZOR™ Antimicrobial Coating is non-dissipating, non-leaching, non-migrating from the applied substrate and cannot be absorbed by micro-organisms or by humans.

The results presented in this report support MDL's claims regarding RAZOR Microbiostatic Antimicrobial Coating. Independent laboratory tests from three different hospitals in three different states show the product to be extremely effective at decreasing the amount of bacteria and other harmful microbes on both porous and non-porous surfaces over a period of several months.

See more about RAZOR™ Antimicrobial Coating at www.GermExperts.com .