

Scientific Air Solutions



airPHX Companies
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Second - In-Treatment Report – [REDACTED] Dental Care – Final Report

Summary

Pre-treatment air and contact swab samples were taken 03/24/17, In-treatment samples taken 03/26/17 and 04/20/18 with average results by location for air samples are given in Table #1, and results for contact swab samples are given in Table #2.

Sample Date	Sample	Number of samples	Location	Average cfu/m ³	Average cfu/cm ²	Range	Standard Deviation	Percent Difference
03/24/17	Air	17	Various Locations	586		100/1,100	269.1	-
03/26/17				80		0/167	39.7	86.3
04/20/18				12		0/67	19.6	98.0
03/24/17		2	Exterior	3,200		2,867/3,533	333.3	-
03/26/17				3,083		2,700/3,467	383.3	3.7
04/20/18				3,433		3,300/3,567	133.3	7.3
03/24/17	Contact	16	Various Locations		303	201/386	79.9	-
03/26/17					9	5/11	1.6	97.0
04/20/18					2	1/4	0.9	99.3

Background

Air samples were taken via the MB-2 air sampler, 30 liters per sample throughout the various locations given above with results normalized to colony forming units per cubic meter of air (CFU/m³).

Contact (Swab) Samples were taken via 3M environmental sponge. Samples were taken in a 10 x 10 cm square (approximately 4 inch) and serial diluted onto standard methods media with results normalized to colony forming units per square centimeter of contact surface (CFU/cm²).

Results – Air Samples

Noted below is an overview of the types of airborne organisms found in locations on Table #1 during the **Pre-treatment** air sampling.

Species	Raw Count	Species	Raw Count
<i>Penicillium, aspergillus types</i>	4,350	<i>Cladosporium sphaerospermum</i>	1,660
<i>Aspergillus fumigatus</i>	3,570	<i>Absidia, spp</i>	1,324
<i>Pseudomonas spp</i>	2,400	<i>Penicillium purpurogenum</i>	950
<i>Penicillium brevicompactum</i>	1,950	<i>Basidiospores spp</i>	750

Noted below is an overview of the types of airborne organisms found in locations on Table #1 during the **In-treatment** sampling.

Species	Raw Count	Species	Raw Count
<i>Penicillium, aspergillus types</i>	1,750	<i>Cladosporium sphaerospermum</i>	810
<i>Aspergillus fumigatus</i>	1,400	<i>Absidia, spp</i>	695
<i>Pseudomonas spp</i>	1,290	<i>Penicillium purpurogenum</i>	450
<i>Penicillium brevicompactum</i>	921	<i>Basidiospores spp</i>	370

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Pre-treatment bioburden from the air samples are 586 cfu/m³ which is > 300 cfu/m³ and is not acceptable and needs corrective action, per the Target Air Quality recommendation below.

In-treatment air samples show a 86.3% reduction to 80 cfu/m³ and now is < 100 cfu/m³ which is considered clean and acceptable.

Second In-treatment air samples show a **98.0%** reduction to **12 cfu/m³** and continues to be < 100 cfu/m³ which is considered **clean and acceptable**.

Target Air Quality

Air quality scale for workplaces, public buildings, schools, and homes is as follows, air with:

- < 100 cfu/m³ is considered **clean and acceptable**.
- 100 to 300 cfu/m³ is **marginal**.
- > 300 cfu/m³ is **not acceptable** and needs corrective action.

In most cases, air quality < 100 cfu/m³ has shown a decrease in the overall bioburden of bacteria/fungi and odors.

Observations - Air

As can be seen outside air samples are adding a significant amount of the bioburden to the Dental facility. Even with this heavy bioburden, the air treatment system continues to reduce the air samples to acceptable levels.

Results – Contact (Swab) Samples

Pre-treatment bioburden from the air samples were 303 cfu/cm² which is > 10 cfu/cm² and considered not acceptable, needs corrective action per the Target Contact Surface Quality recommendation given below.

In-treatment swabs results show a 97.0% reduction to 9 cfu/cm² and now is in the 5 to 10 cfu/cm² which is considered marginal, it is anticipated that continued treatment would further reduce to clean and acceptable.

Second - In-treatment swabs results show a **99.3%** reduction to **2 cfu/cm²** and now is in the < 5 cfu/cm² which is considered **clean and acceptable**.

Target Contact Surface Quality


Contact surface quality scale for workplaces, public buildings, schools, and homes are as follows:

- < 45 cfu total or < 1.67-log, or < 5 cfu/cm² is considered **clean and acceptable**.
- 140 to 260 cfu total or 2.15 to 2.41-log, or 5 to 10 cfu/cm² is considered **marginal**.
- > 260 cfu total or > 2.41-log, or > 10 cfu/cm² is considered **not acceptable** and needs corrective action.

In most cases, air quality < 45 cfu total or < 5 cfu/cm² has shown a decrease in the overall bioburden of bacteria/fungi and odors.

Please contact me if there are questions or if further information is needed.

Respectfully submitted,


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Senior Principal Scientist

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Table #1
 [Redacted] Dental Care
 Second – In-treatment Air CFU/m² and Contact Sample Results - CFU/cm²

[Redacted] Dental Care - Second - In-treatment						
Room	Plate Lot No.	Air Sample Location	Air Sample Location	Raw Count	Corrected Count	CFU/m3
Control 1	1013	Control Plate	Unopened	0	0	0
B	1025	1	OR #5	0	0	0
B	1029	2	OR #4	1	1	33
B	1033	3	OR #3	0	0	0
B	1037	4	Consulting Room	0	0	0
B	1041	5	OR #2	0	0	0
B	1045	6	OR #1	1	1	33
B	1049	7	Staff Office	0	0	0
B	1676	8	Storage and Equip	0	0	0
B	1668	9	Reception	1	1	33
B	1660	10	Reception	0	0	0
B	1652	11	Reception	2	2	67
B	1644	12	Waiting Room	0	0	0
B	1636	13	Waiting Room	0	0	0
B	1628	14	Bathroom	1	1	33
B	1620	15	Breakroom	0	0	0
B	1612	16	Breakroom	0	0	0
B	1604	17	Staff Office	0	0	0
B	1017	Exterior - 1	Ext	80	99	3,300
B	1021	2	Ext	85	107	3,567

Avg 12
 Low 0
 High 67
 SD 19.6

Avg 3,433
 Low 3,300
 High 3,567
 SD 133.3

Total Adjusted Raw Count **212**
 Total CFU/m3 **7,067**

Room	Swab Lot No.	Plate Number	Surface Swab Sample Location	10x10x10 cm	Raw Count	CFU/cm2
Control 1		10	Control swab	0	0	0
MD		1	Chair @1 Opt5	10x10x10	210	2
MD		2	Xray @ 1 Op5	10x10x10	150	2
MD		3	Light @1 Opt 5	10x10x10	100	1
MD		4	PC-1000 Opt 5	10x10x10	330	3
MD		5	Chair @5 Opt2	10x10x10	120	1
MD		6	Xray @ 5 Op2	10x10x10	215	2
MD		7	Light @ 5 Opt 2	10x10x10	275	3
MD		8	Computer @5 Opt2	10x10x10	420	4
MD		9	Tool Caddy @5 Opt 2	10x10x10	150	2
MD		10	M11 Ultraclave San	10x10x10	90	1
MD		11	Toilet Bath @14	10x10x10	210	2
MD		12	Sink Bath @14	10x10x10	320	3
MD		13	Table Breakroom @15	10x10x10	185	2
MD		14	Fridge Breakroom @16	10x10x10	200	2
MD		15	Reception Counter	10x10x10	210	2
MD		16	Keyboard + Mouse @7	10x10x10	310	3

Avg 2
 Low 1
 High 4
 SD 0.9

Total Adjusted Raw Count **3,495**
 Total CFU/cm2 **35**

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Table #2
██████████ Dental Care
In-treatment Air CFU/m² and Contact Sample Results - CFU/cm²

██████████ Dental Care - In-treatment						
Room	Plate Lot No.	Air Sample Location	Air Sample Location	Raw Count	Corrected Count	CFU/m ³
Control 1	1013	Control Plate	Unopened	0	0	0
B	1025	1	OR #5	2	2	67
B	1029	2	OR #4	2	2	67
B	1033	3	OR #3	0	0	0
B	1037	4	Consulting Room	2	2	67
B	1041	5	OR #2	2	2	67
B	1045	6	OR #1	3	3	100
B	1049	7	Staff Office	4	4	133
B	1676	8	Storage and Equip	2	2	67
B	1668	9	Reception	5	5	167
B	1660	10	Reception	2	2	67
B	1652	11	Reception	4	4	133
B	1644	12	Waiting Room	2	2	67
B	1636	13	Waiting Room	5	5	167
B	1628	14	Bathroom	2	2	67
B	1620	15	Breakroom	4	4	133
B	1612	16	Breakroom	0	0	0
B	1604	17	Staff Office	0	0	0
B	1017	Exterior - 1	Ext	71	86	2,867
B	1021	2	Ext	84	106	3,533

Avg 80
 Low 0
 High 167
 SD 51.2

Avg 3,200
 Low 2,867
 High 3,533
 SD 333.3

Total Adjusted Raw Count **233**
 Total CFU/m³ **7,767**

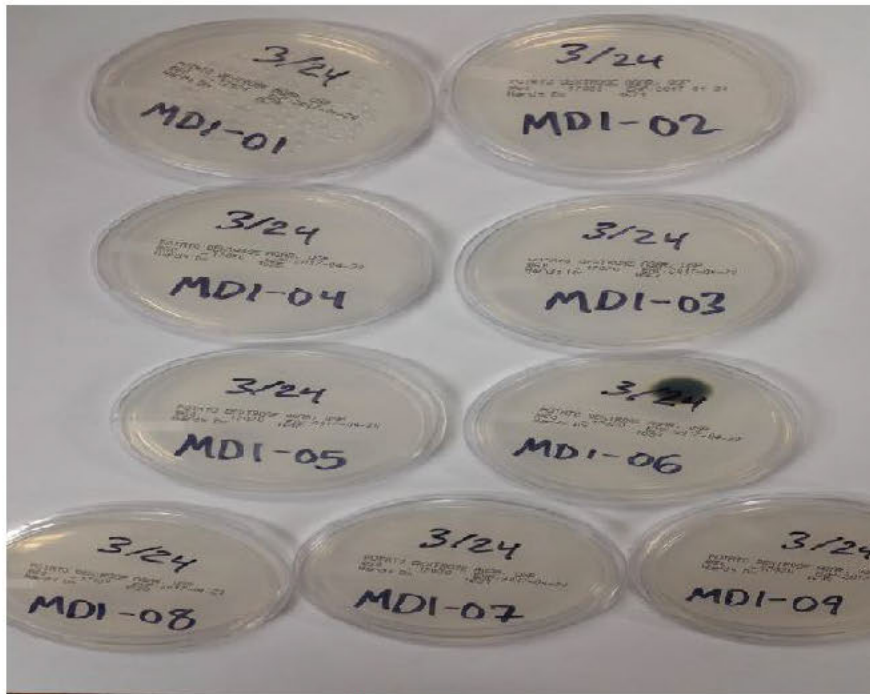
Room	Swab Lot No.	Plate Number	Surface Swab Sample Location	10x10x10 cm	Raw Count	CFU/cm ²
Control 1		10	Control swab	0	0	0
MD		1	Chair @1 Opt5	10x10x10	875	9
MD		2	Xray @ 1 Op5	10x10x10	500	5
MD		3	Light @1 Opt 5	10x10x10	800	8
MD		4	PC-1000 Opt 5	10x10x10	1,000	10
MD		5	Chair @5 Opt2	10x10x10	650	7
MD		6	Xray @ 5 Op2	10x10x10	980	10
MD		7	Light @ 5 Opt 2	10x10x10	890	9
MD		8	Computer @5 Opt2	10x10x10	1,100	11
MD		9	Tool Caddy @5 Opt 2	10x10x10	875	9
MD		10	M11 Ultraclave San	10x10x10	890	9
MD		11	Toilet Bath @14	10x10x10	1,000	10
MD		12	Sink Bath @14	10x10x10	800	8
MD		13	Table Breakroom @15	10x10x10	900	9
MD		14	Fridge Breakroom @16	10x10x10	1,000	10
MD		15	Reception Counter	10x10x10	870	9
MD		16	Keyboard + Mouse @7	10x10x10	575	6

Avg 9
 Low 5
 High 11
 SD 1.6

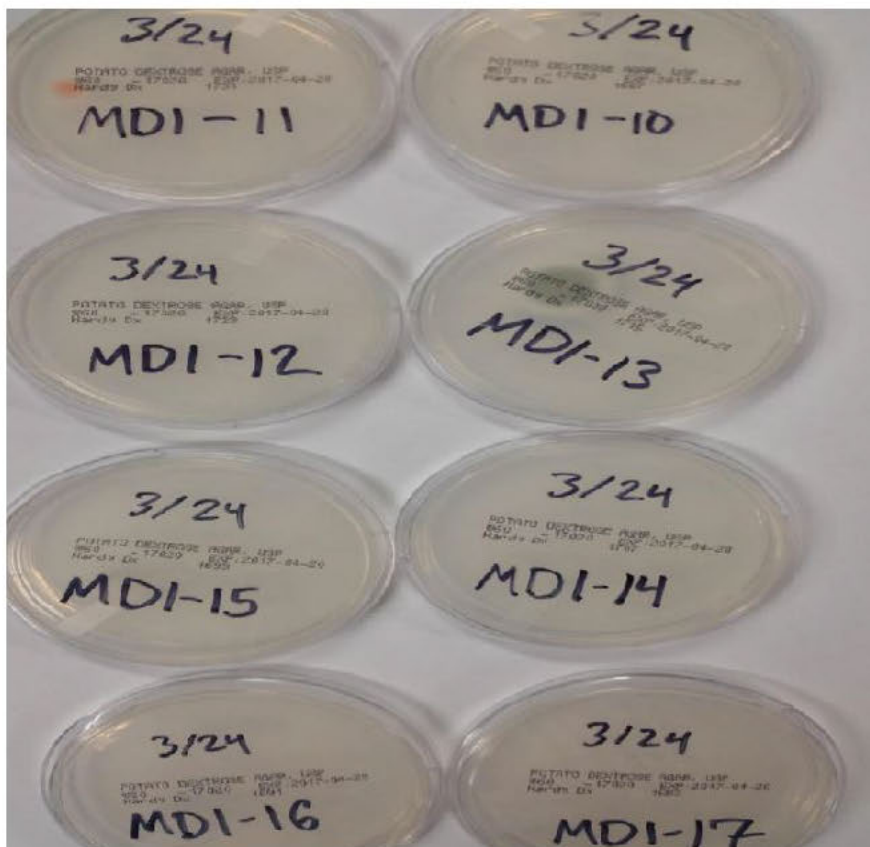
Total Adjusted Raw Count **13,705**
 Total CFU/cm² **137**

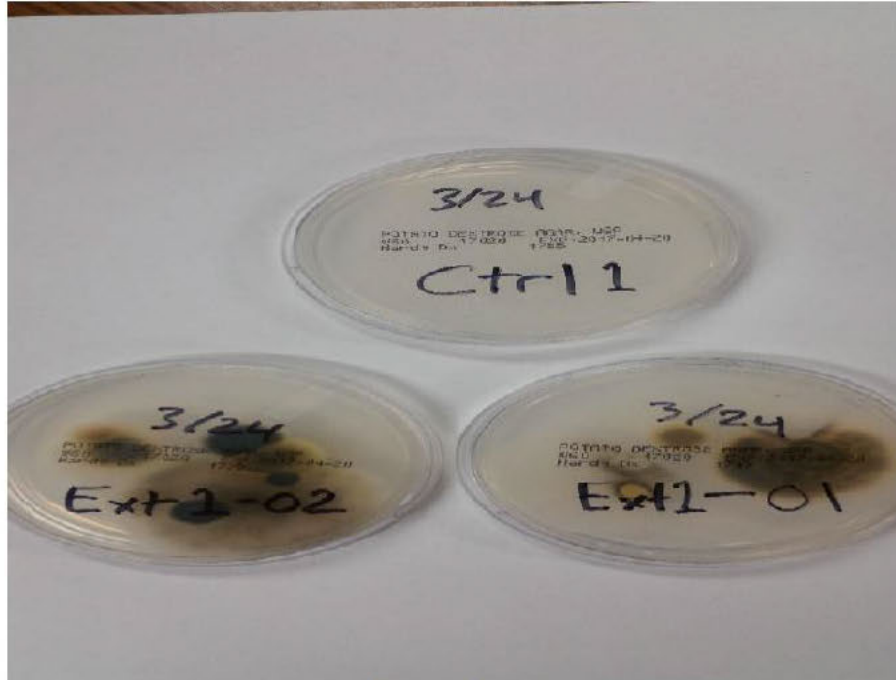


Table #3
██████████ Dental Care
Pre and In-treatment and Second In-treatment Pictures

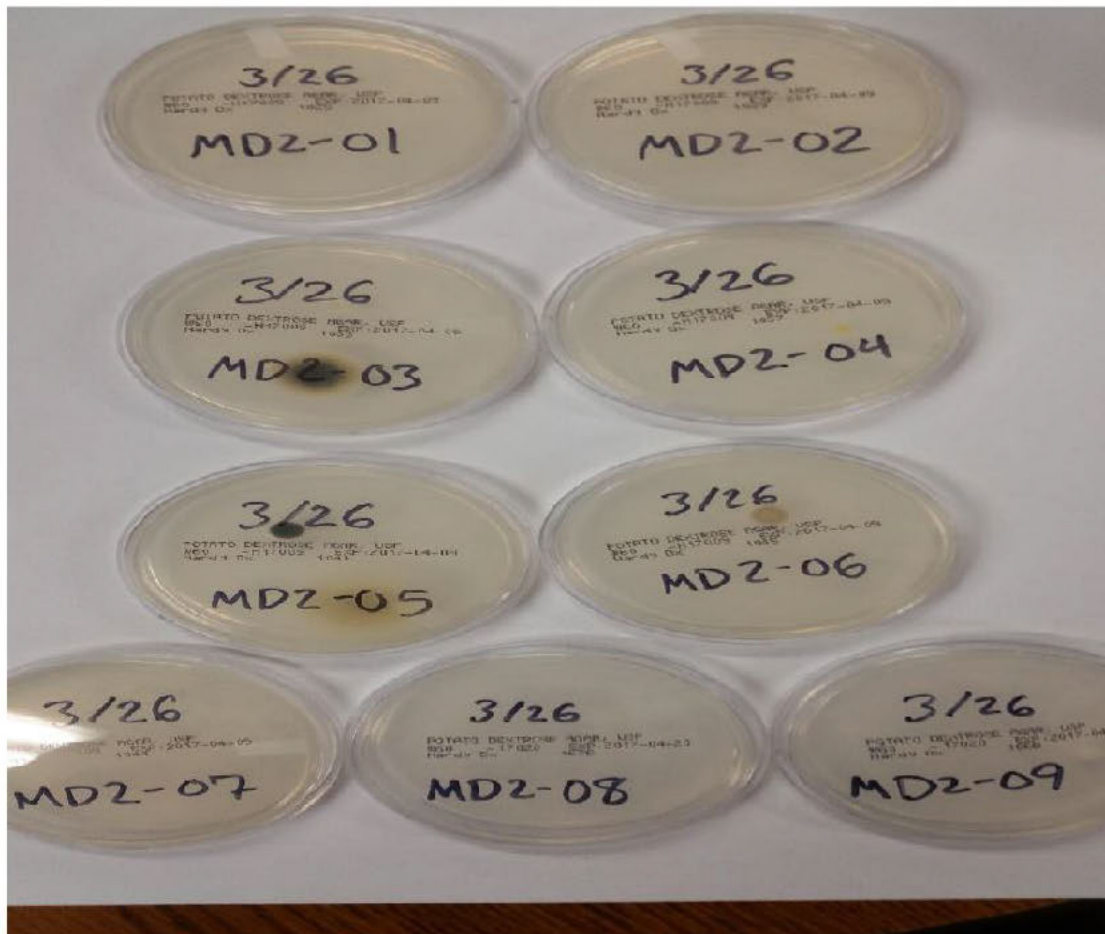


Pre-treatment

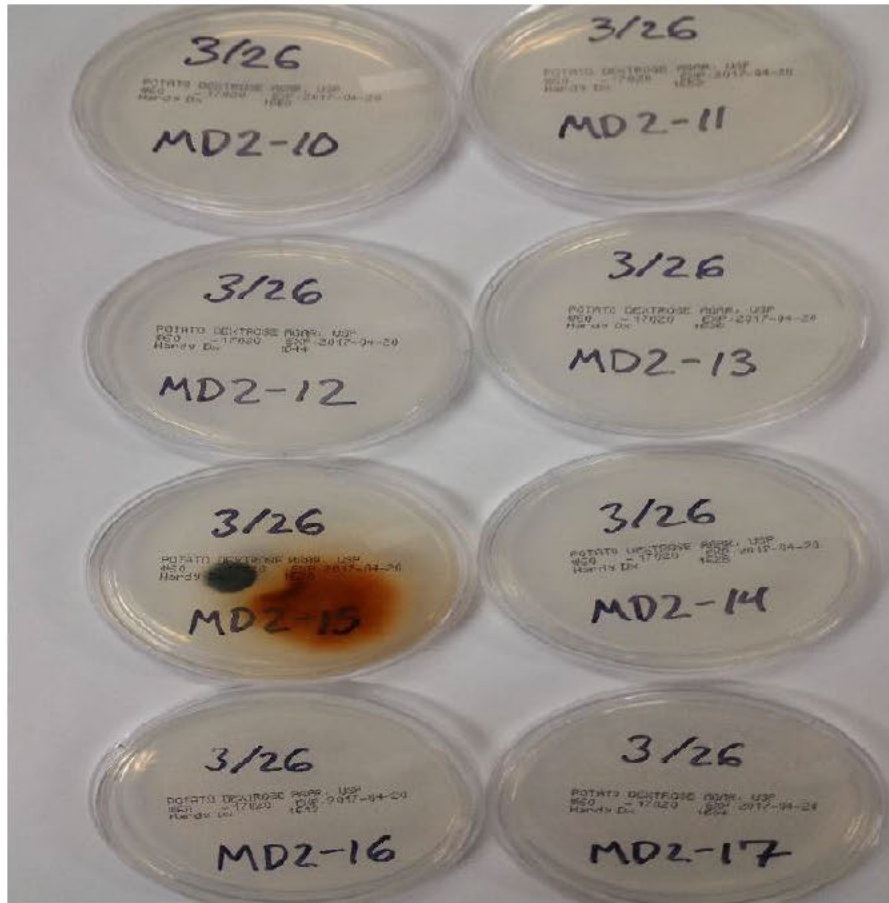




Pre-treatment



Post Treatment



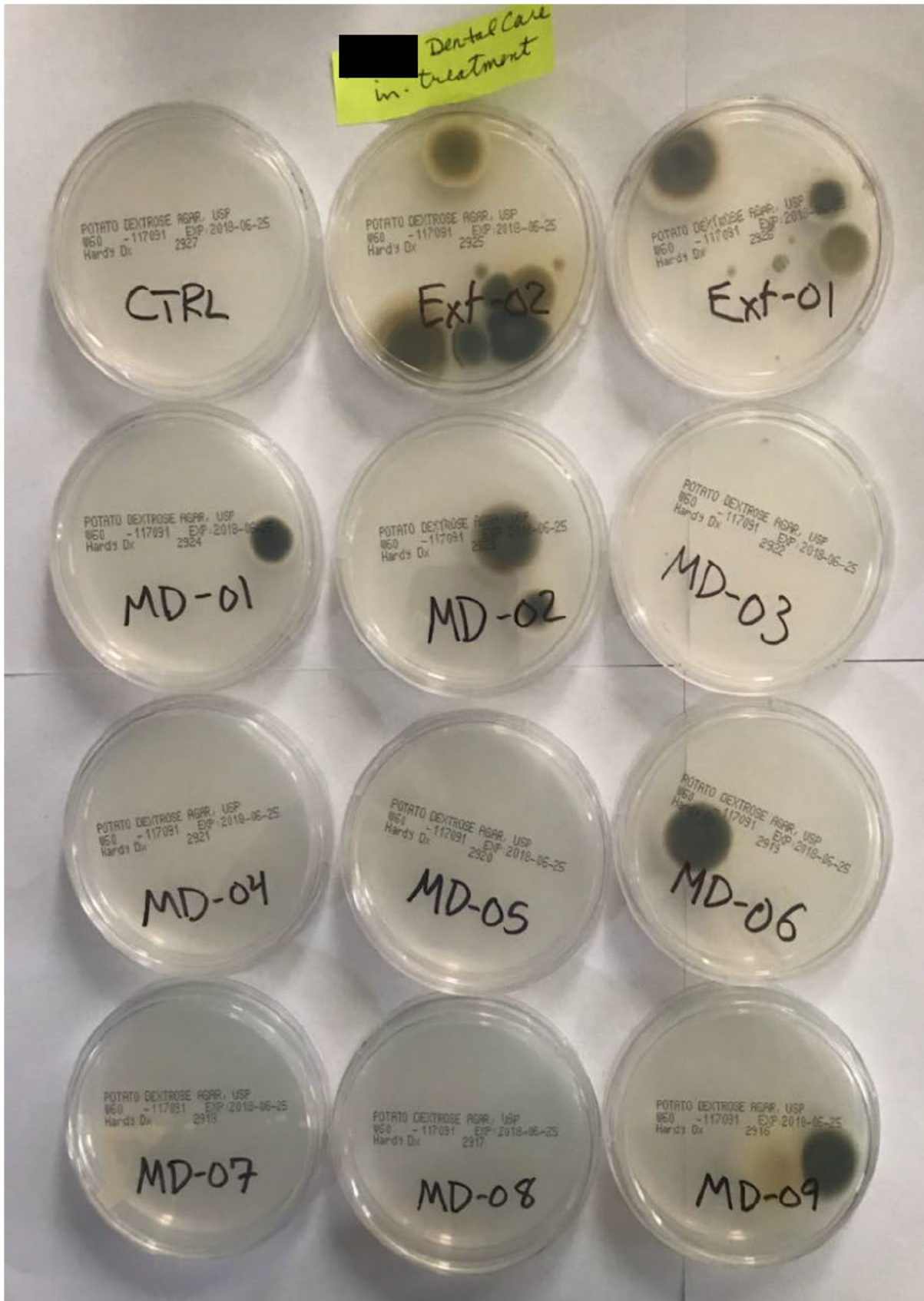
Post Treatment



Post Treatment

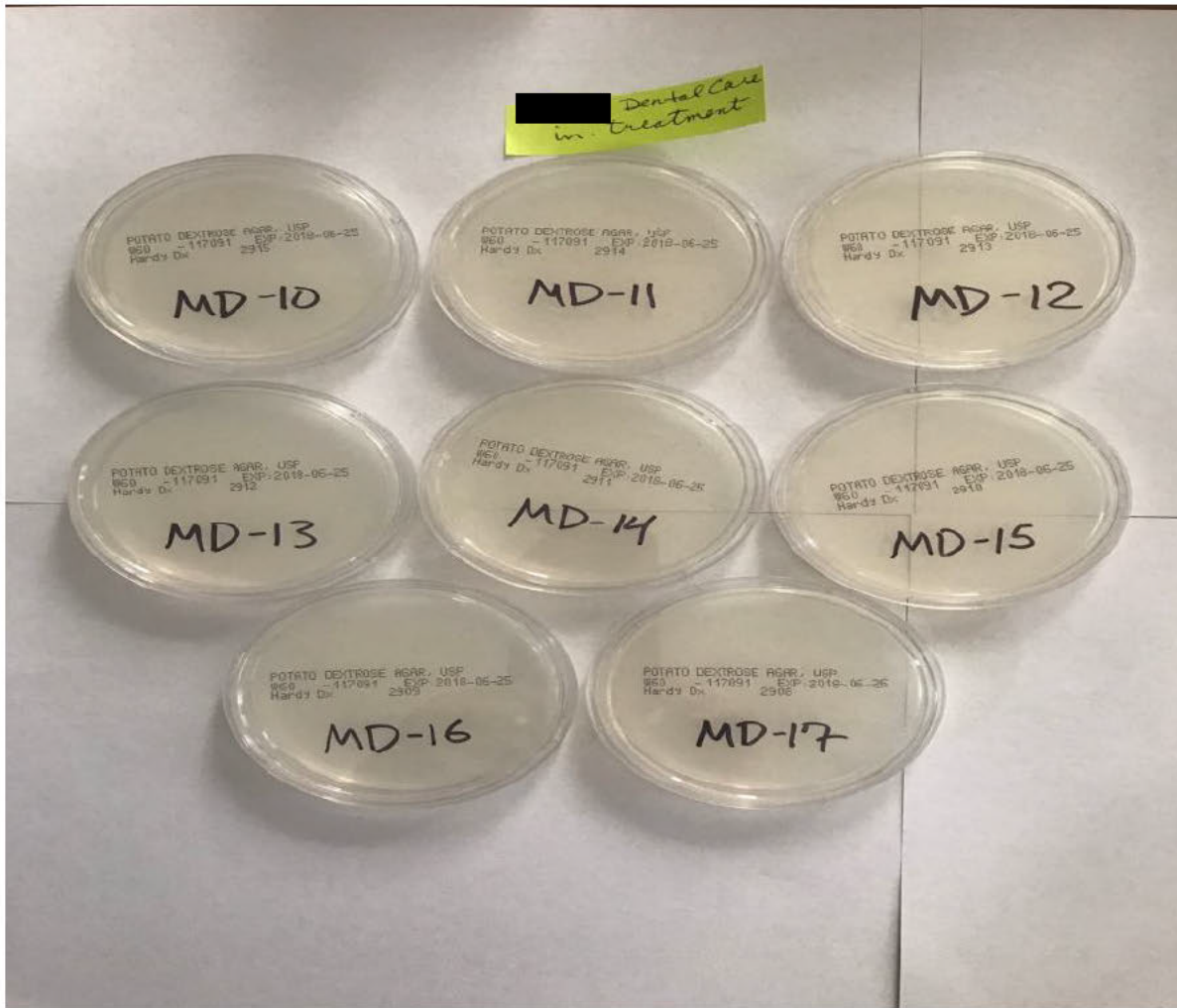


Second – In-treatment Pictures





Second – In-treatment Pictures



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