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KEEPING CLEAN HANDS..... CLEAN!!!

A STUDY OF DOOR HANDLES, THEIR CONTAMINATION LEVELS AND THE EFFECT OF A HANDLE HYGIENE SANITISING SYSTEM ON THEM, IN A BUSY HOSPITAL ENVIRONMENT.

Introduction

Door handles and particularly washroom door handles are a well-documented fomites.

It is a simple fact, not everybody washes their hands after using the toilet.

Indeed, washing and drying your hands in an improper manner, can be even more harmful than not washing them at all, since damp or moist hands facilitate the easy transfer of germs to or from a handle.

Their common and frequent use, make it impossible for standard cleaning procedures alone to maintain their surfaces at what is considered a safe microbial level. In turn creating a real risk for onward transmission and a threat to immunocompromised individuals, who are often at their most vulnerable.

As this study demonstrates, the Handle Hygiene system maintains the microbial levels on door handle surfaces at a negligible level in between cleans, regardless of how often they are touched.

TRIAL:

The purpose of the trial was twofold:

A. To demonstrate the level of contamination, if any, on a number of commonly touched door handles in the hospital.

B. To demonstrate the efficacy of the Handle Hygiene Sanitising System on contaminated door handles in a hospital.

To ensure we complied with best practice, for the purpose of this trial, it was agreed to engage the use of Nordia Hygicult TPC contact slides. (a means recommended for such testing by Infection Control Specialist Dr. Stephanie Dancer, NHS. Lanarkshire, Scotland.)

The slides have a total count agar on either side that supports the rapid growth of bacteria and fungi and come complete with built-in neutralising agents for accurate recovery.

PLACEMENTS

Twelve doors on two different levels in the hospital, the A&E Dept. and Men's Ward 8, were selected for inclusion in the trial.

1. The inside handle of the entrance door to the isolation room in A&E
2. The inside handle of the toilet in the isolation room.
3. The inside handle of the Sluice room door in A&E
4. The outside handle of the Sluice room door in A&E
5. The inside handle of the Sluice room door in Ward 8.
6. The outside handle of the Sluice room door in Ward 8.
7. The outside handle (ward side) on the exit door to the toilet in 2nd Men's ward.
8. The inside handle (toilet side) on the exit door to the toilet in 2nd Men's ward.
9. The outside handle (ward side) on the exit door to the toilet in 1st Men's ward.
10. The inside handle (toilet side) on the exit door to the toilet in 1st Men's ward
11. The inside handle on the toilet door in isolation room ward 8.
12. The inside handle on the entrance door to the isolation room in ward 8.

STAFF INCLUSION

Before commencing the trial, the system was introduced where possible to staff on the ground in both areas, so as to gain their support and to give them an understanding of what it was about and how it worked and to alleviate any concerns that can surround the introduction of any new product into the workplace.

The system gained huge approval amongst staff and was spoken about positively throughout the course of the trial, demonstrating staff support for a system that can help reduce infections without interfering with normal day to day working practices.

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PROCEDURE

The Handle Hygiene Door Unit

On Nov 3rd, prior to the installation of the Handle Hygiene door units, all handles on the selected doors were sampled for microbial growth, using Hygicult Contact Slides, samples were taken from various parts of each handle, top, bottom, front and back.

The sample slides were then placed in an incubator for 48 Hrs. at 35-37°C, in accordance with the manufacturer's instructions. These were then used as a base line for comparison purposes.

Further samples were again collected on November 8th, 10th, 14th and 20th and again all slides were incubated for 48 hours.

On Nov. 10th (H/H.3) the Ladies and Gents toilet door handles in the main reception area had their microbial levels randomly sampled also for comparison purposes.

On Nov.14th (H/H.4) the handles on two more test doors were also randomly selected, a Staff toilet and a Patient toilet, to demonstrate how readily and easily such handles become contaminated in between cleans.

Sampling of the door handles was completed one week later, Nov. 20th (H/H.5) as the trial was completed.

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RESULTS

Upon completion of the trial, the swabs were all grouped and documented along with all data collected and forwarded to Trinity College Dublin for analysis. The results are seen here with typical examples of slides from each test.

H/H 1 Typical slides from baseline collected Nov.3rd.

Samples collected Pre-Installation. **(No Handle Hygiene system fitted)**

H/H 2 Typical samples with units installed collectedNov.8th

Samples collected post-Installation. **(with Handle Hygiene system fitted)**

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H/H 3

Typical samples from doors with Units installed collected Nov.10th



Doors with Handle Hygiene system fitted.

H/H 3

Sample of two randomly selected doors,

Ladies and Gents at main reception area.

Collected Nov. 10th


Doors without Handle Hygiene system fitted.

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H/H 4

Typical samples collected from doors with units Installed.

Collected Nov 14th



Doors with Handle Hygiene system fitted.

H/H 4

Samples of randomly selected doors,

1 staff and

1. patient toilets, with no units,

Collected Nov.14th


Doors without Handle Hygiene system fitted.

H/H 5

Typical samples collected from doors with units installed.

Collected Nov. 20th



Doors with Handle Hygiene system fitted.

FINDINGS

The analytic report by Dr. Ronnie Russell of Trinity College Dublin in section 2 of this report, outlines how the handles, prior to installation of the Handle Hygiene units, harboured considerable contamination, with a range of Bacteria, Yeast and Fungi, sufficient to ensure that any clean hand that touched them was vulnerable to contamination.

Some of the bacterial colonies found on the handles included species of Staphylococcal, Klebsiella, Micrococcus, Prevotella, Bacillus, Stenotrophomonas and Pseudomonas all of which pose a risk to any Healthcare Environment and its occupants.

Dr. Russell's report also clearly demonstrates the effect of the Handle Hygiene Sanitising on such contaminated door handles, reducing the Colony Forming units (Cfu's) count from an average of 49 cfu's per swab on the original baseline, to an average of just 1 cfu and then levelling at an average 2.2 cfu's on each of the swabs after the introduction of the Handle Hygiene system.

ANAYLISIS:

Brian

have looked at the slides you have sent and the simplest way of explaining the efficacy is as follows:

On Nov. 3rd prior to introducing your system, 18 samples were taken from door handles in the hospital. There were 888 colony forming units recovered from these handles which averages out at 49 per sample.

The next set of samples after commencement of use of the handle hygiene units, taken on Nov. 8th had only 26 colony forming units between all 24 samples, which is an average of just over one per sample.

Samples taken on Nov 10th were all terrific apart from 7A. Even though it looks bad there are only three colonies on it and one of them is bacillus which is motile and swims all over the place. The extra swabs taken from the ladies and gents toilets at the reception area showed mixtures of everything including staphylococci.

The samples taken on 14 November had 66 colony forming units on 19 samples which was an average of 3.5 colony forming units per sample, also on 14 November four extra samples were taken from staff and patient toilet door handles. These produced 65 colony forming units plus an amount of probably pseudomonas biofilm per sample which is an average of over 16 colony forming units per sample.

The final set of samples from 20 November had 44 colony forming units on 20 samples which is an average of 2.2 colony forming units per sample.

Note: the bacterial colonies seen in these samples suggest a wide range of species including those typical of staphylococcal species, Klebsiella, general coliforms, micrococcus, prevotella, Bacillus species, possibly stenotrophomonas and very definitely pseudomonas. These would need to be speciated properly in a laboratory however. There are doubtless many opportunistic species and pathogenic species present here and it would be worthwhile looking at their antibiotic resistance patterns also. They do present risk in a healthcare environment.

From the results obtained, it is clear that the handles sampled prior to use of disinfectant were a vector of microbial dissemination between users and further dissemination to the healthcare environment.

Although the figures from these handles which were subjected to normal hospital cleaning procedures averaged 49 per sample, one should remember that these contact slides can only sample a fraction of each handle, therefore the total counts per handle are much much higher.

After use of the disinfectant, the average bacterial count per sample dropped to 1, 3.5 and 2.2 on the respective days or an average of 2.1 colony forming units per sample overall. This is quite a significant reduction and would contribute to infection-control measures in the hospital.

An observation regarding the samples: there are one or two anomalous results both before and after implementation of the disinfection system. These, in my experience, are caused by users whose hands are wet and where disinfectant is used, it takes longer for the disinfectant to work due to dilution. There is also evidence in these cases that quite a number of bacterial species may have come from the hot water system or taps indicated by the pseudomonas and Bacillus species particularly.

In this series of tests, although quite limited, it can be seen that the disinfection system almost eliminates microbial carriage on the door handles.

Kind regards,

Ronnie

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