GRABO

SILVERKNIGHT

ELIMINATES HARMFUL MICRO-ORGANISMS.

DURABLE & STAIN RESISTANT.

PERFORMANCE, FEATURES & BENEFITS

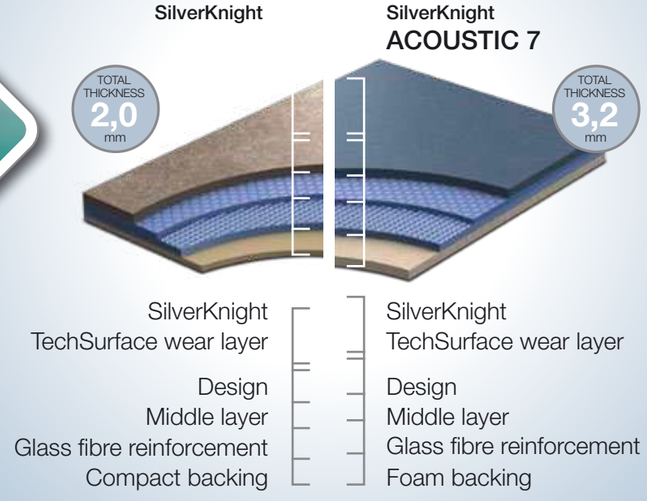
Grabo SilverKnight eliminates harmful bacteria without the use of chemicals. Grabo SilverKnight has a self-disinfecting surface reached by a unique double-defense-line.

RECOMMENDED USAGE

Healthcare | Education | Hospitality
Offices | Retail

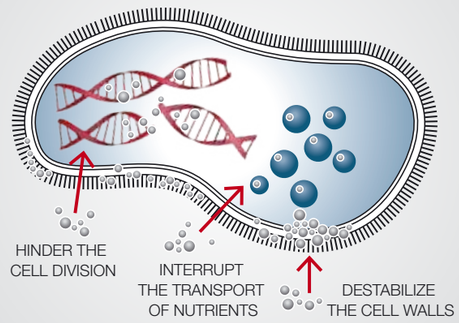
DESCRIPTION		SilverKnight Diamond Tech	SilverKnight Acoustic 7
Construction		compact heterogeneous	heterogeneous
Total thickness	EN ISO 24346	2,0 mm	3,2 mm
Wear layer thickness	EN ISO 24340	0,7 mm	0,7 mm
Width of roll	EN ISO 24341	2 m	2 m
Length of roll	EN ISO 24341	20 lm	20 lm
Total weight	EN ISO 23997	2,8 kg/m²	2,6 kg/m²
CLASSIFICATION			
European classification	EN 685	class: 34/43	class: 34/42
PERFORMANCE			
Abrasion group	EN 660-1	T	T
Residual indention	EN ISO 24343	max. 0,1 mm	max. 0,2 mm
Dimensional stability	EN ISO 23999	max. 0,2 %	max. 0,2 %
Fire resistance	EN 13501-1	class: Bfl-s1	class: Bfl-s1
	ASTM E 648/ 662	class: Class1	-
	Gost 30402-94	G1	G1
Impact sound reduction	EN ISO 717-2	-	ΔL_w=19 dB
Slip resistance	DIN 51130	R9	R9
Electrical resistance	EN 1815	< 2 kV	< 2 kV
	EN 1081	≤ 10^9 Ω	≤ 10^9 Ω
Chemical resistance	EN ISO 26987	✓	✓
	ASTM F925-02	✓	✓
Bacterial resistance	EN ISO846:1999	✓	✓
Antimicrobal activity	ISO 27447	>99 %	>99 %
Light fastness	EN 20105 B02	grade 6	grade 6
Castor chair resistance	EN ISO 4918	✓	✓
Surface treatment		TECHSurface	TECHSurface
Anti bacterial and fungicid treatment		Silver Knight	Silver Knight
Seaming methot		hot or cold welding	hot or cold welding
Warranty		15 year	15 year

CONSTRUCTION



1ST LINE OF DEFENSE

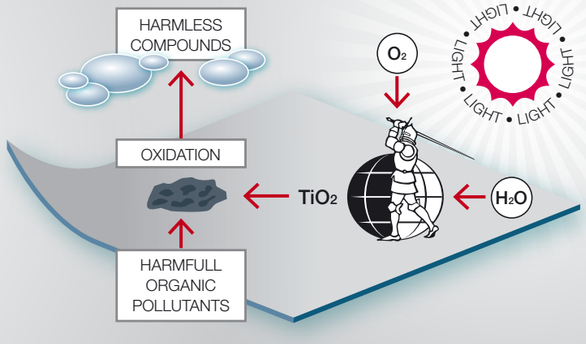
Silver – bacteria & viruses are destroyed without the use of chemicals



2ND LINE OF DEFENSE

TiO_2 – helps to decompose germs

Titanium dioxide is a photocatalyst, operating similar to chlorophyllian photosynthesis which helps transform harmful substances into harmless compounds through a chemical oxidation process without being consumed.



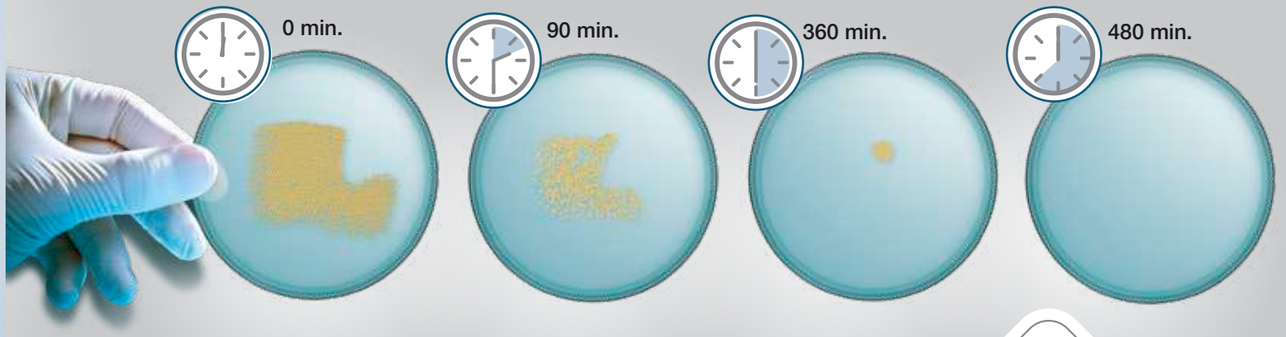
GRABO SILVERKNIGHT FLOORING

More effective infection control with easy cleaning

Due to the photocatalytic reaction, the surface energy is increased so dirt adheres less and is easier to remove. Grabo SilverKnight is active round the clock, 24/7, and helps to reduce microbial contamination in between cleanings.

Improve indoor air quality

Through photocatalysis odors are decomposed into harmless constituent parts. Grabo SilverKnight is the ultimate, environmentally sound choice.



GRABO USA

For more information:
SPECIFIED SOLUTIONS INC. www.SpecifiedSolutionsInc.com info@specifiedsolutionsinc.com (864) 414-3675

SILVERKNIGHT |

LOTUS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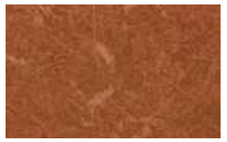
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SILVERKNIGHT |

WOOD


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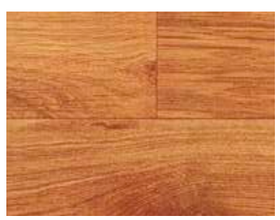
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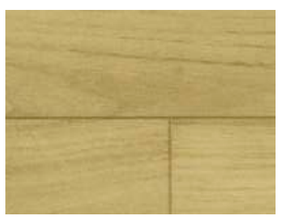
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SILVERKNIGHT |

ROCK


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386-869

SILVERKNIGHT |

UNI


2956


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9170


3258


1343


1895


6108

GRABO USA

GRABO SILVERKNIGHT – FREQUENTLY ASKED QUESTIONS

What is the difference between the bacteria/virus eliminating effect of SilverKnight Flooring versus antibacterial properties of some other floors?
The bacteria & virus elimination technology within SilverKnight means that pathogens are destroyed by coming in contact with the surface. Generally, floorings promoting antibacterial properties do not actually destroy pathogens, rather they prevent the further growth/reproduction of bacteria.

Are silver and titanium dioxide harmful?

No. Both are inert earth minerals. Silver has been used for centuries (from the early making of cutlery, cups and surgical instruments to modern-day advanced technologies). Titanium dioxide is widely used in the textile industry, health & beauty products and also the production of building materials.

Is SilverKnight flooring recyclable?

Yes. SilverKnight floors are 100% recyclable in addition to containing recycled content. Grabo floors are low VOC and manufactured using no-waste processes.

Is the silver and titanium dioxide within SilverKnight released into the environment? No. They are molecularly bonded within the wear layer of the flooring. The patented Tech Surface ensures that silver and titanium dioxide are integrated into the surface, without being released. Assuring they will not wash or wear-away, thus maintaining effectiveness for the full life of the floor.

Can bacteria gain resistance towards the SilverKnight flooring?

Virus & bacteria cells are always adapting to their environment. The all-natural technology utilized by SilverKnight is far less likely to cause resistance than man-made chemical agents such as bleach and anti-microbial cleaners.

Is SilverKnight tested to be efffective against bacteria?
Yes. Independent Laboratory Testing shows SilverKnight Flooring reduces bacteria including MRSA, VRE, ESBL & C Difficil. Silver can destroy over 600 various kinds of bacteria; therefore, the flooring surface efficiency is not limited to only the bacterium strains included in the test. In addition titanium dioxide/TiO2 oxidizes all organic matters without exception.

Is SilverKnight tested to be effective against viruses?
Yes. Grabo SilverKnight has been independently tested to show its technology is also efficient against viruses. See Human Coronavirus 229E testing showing 99% reduction and Manufacturer's Declaration regarding significant reduction of Norovirus.

Are SilverKnight floors cost-effective?
Yes. SilverKnight is priced within the same range as other quality flooring materials.

PRODUCT PERFORMANCE TESTING LABORATORY
100 Clemson Research Blvd., Anderson, SC 29625
Phone 864.646.8453 Fax 864.646.2821
Email testing@tcnatile.com Web www.TCNAtile.com

TCNA TEST REPORT NUMBER: TCNA-0086-21

Test Results: Results of testing performed with Human Coronavirus 229E on **Si**

Sample	Virus	Cell line	Infectivity titer TCID50/mL	Contact exposure time	Percentage Reduction (%)*
Sample 1	Human Coronavirus 229E	MRC-5	TCID50/mL 10^6	24 hours	99.99%
Sample 2					99.99%
Sample 3					99.99%

**Reduction calculated based on the infectivity titer of viruses recovered from control glass samples after 24 hours of contact time*

The above test was performed using Human Coronavirus 229E (common cold) as this is a surrogate for Covid 19/SARS.

Reasoning backed by science would suggest Covid19/SARS will react in the same manner, showing significant reduction when exposed to the SilverKnight surface.

For full Test Results and more information contact:

Specified Solutions Inc.
info@specifiedsolutionsinc.com
phone (864) 414-3675

GRABO SilverKnight Floor Coverings

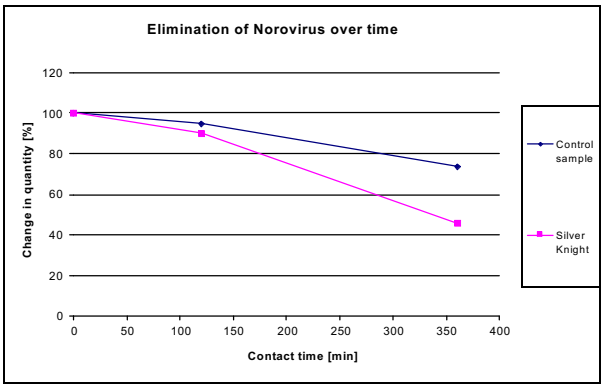
MANUFACTURER'S DECLARATION

Graboplast, a 115-year-old leading floor manufacturer headquartered in Europe, declares that beyond their bactericidal properties, floor coverings made with GRABO SilverKnight technology are efficient also against viruses.

The proprietary GRABO developed SilverKnight floor coverings eliminate more than 99% of various bacteria within 8 hours due to their photocatalytic self-disinfecting effects. Their self-disinfecting property is ensured by the unique double-defense system, which is a natural antibiotic, a combination of silver and layer inducing molecular oxidation that can be activated by the effect of light. The virucide effect of the silver nanoparticles against the wide range of viruses is confirmed.[1]

According to the test made by the Institute of Clinical Microbiology and Diagnostics of the University of Szeged, the GRABO SilverKnight technology has proved to be efficient against viruses.

After 120 minutes, there is a significant difference between the virus contamination of the GRABO SilverKnight surface and the control sample. And after six hours, the number of norovirus is reduced by 54% on the GRABO SilverKnight surface.[2]



The virucide disinfectants efficiently remove viruses from the surfaces, however, they remain effective only during the contact time.

Based on the above, it is obvious that the coverings made with GRABO SilverKnight technology actively contribute to protection against viruses in the period between disinfecting cleaning operations.

As soon as capacity of the properly equipped labs allow it, our aim is to test our wall and floor coverings made with Grabo SilverKnight technology for SARS-CoV-2 coronavirus. The above declaration is issued by us on the basis of a customer demand, for customer information purposes.

GRABOPLAST Zrt. Győr, 16/04/2020

[1] „Metal nanoparticles, especially the ones produced with silver or gold, have proven to exhibit virucidal activity against a broad-spectrum of viruses, and surely to reduce viral infectivity of cultured cells. In most cases, a direct interaction between the nanoparticle and the virus surface proteins could be demonstrated or hypothesized."
Source: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6264685/ . Access [08.04.2020]

[2] Source: Detection of norovirus on various surfaces under natural light – Report, Institute of Clinical Microbiology and Diagnostics, Faculty of Medicine, University of Győr, Albert Szent-Györgyi Health Centre, Szeged, 2010.

Professional Testing Laboratory, Inc.

Stain & Chemical Resistance Testing

TEST REPORT

TEST NUMBER: 134203

CLIENT	Graboplast zRt
TEST METHOD CONDUCTED	ASTM F925-02 24 Hour Standard Test Method for Resistance to Chemicals of Resilient Flooring
DESCRIPTION OF TEST SAMPLE	
IDENTIFICATION	SilverKnight
CONSTRUCTION	Vinyl

TEST RESULTS

24 HOUR RATINGS			
STAINING AGENT	**SURFACE DULLING**	**SURFACE ATTACK**	**COLOR CHANGE**
5% Acetic Acid	0	0	0
70% Isopropyl Alcohol	0	0	0
Mineral Oil	0	0	0
5% Sodium Hydroxide	0	0	0
5% Hydrochloric Acid	0	0	0
5% Ammonia	0	0	0
Bleach	0	0	0
5% Phenol	0	0	0
Gasoline	0	0	0
Sulfuric Acid	0	0	0
Kerosene	0	0	0
Olive Oil	0	0	0
Blood	0	0	0
Urine	0	0	0
Betadine	0	0	0
Spaghetti Sauce	0	0	0
Crayon	0	0	0
Hair Color	0	0	0
Shoe Polish	0	0	0
Lipstick	0	0	0
Marker	0	0	0
Mustard	0	0	0
Catsup	0	0	0
Food Color	0	0	0

RATING KEY
0 - No change (----)
1 - Slight change
2 - Moderate change
3 - Severe change

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Brief Report

Are hospital floors an underappreciated reservoir for transmission of health care-associated pathogens?

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[d] Geriatric Research, Education, and Clinical Center, Cleveland Veterans Affairs Medical Center, Cleveland, OH

Key Words:
Clostridium difficile
Methicillin-resistant *Staphylococcus aureus*
Vancomycin-resistant enterococci

In a survey of 5 hospitals, we found that floors in patient rooms were frequently contaminated with pathogens and high-touch objects such as blood pressure cuffs and call buttons were often in contact with the floor. Contact with objects on floors frequently resulted in transfer of pathogens to hands.

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Effective disinfection of contaminated surfaces is essential to prevent nosocomial transmission of pathogens such as *Clostridium difficile*, methicillin-resistant *Staphylococcus aureus* (MRSA), and vancomycin-resistant enterococci (VRE).[1,2] Efforts to improve disinfection usually focus on surfaces that are frequently touched by the hands of health care workers or patients (eg, bed rails and call buttons). Although health care facility floors are often heavily contaminated,[3-5] limited attention has been paid to disinfection of floors because they are not frequently touched. However, floors are a potential source of transmission because they are often contacted by objects that are subsequently touched by hands (eg, shoes and socks). In a recent study, it was reported that nonslip socks worn by hospitalized patients were frequently contaminated with MRSA and VRE.[6] Moreover, Koganti et al[7] demonstrated that a nonpathogenic virus inoculated onto floors in hospital rooms rapidly disseminated to the hands of patients and to high-touch surfaces inside and outside the room. Here, we assessed the frequency of contamination of isolation room floors with *C difficile*, MRSA, and VRE and examined the potential for transfer of these pathogens from floors to hands.

METHODS

The study protocol was approved by the institutional review boards for each of the 5 participating Cleveland-area hospitals. Hospital personnel were not made aware of the study. For each hospital, environmental services personnel cleaned high-touch surfaces in *C difficile* infection (CDI) isolation rooms daily with bleach wipes, whereas floors were cleaned during admission only if visibly soiled and were mopped with a quaternary ammonium-based disinfectant after patient discharge. One of the 5 hospitals used an ultraviolet-C room decontamination device as an adjunct to standard cleaning after discharge of CDI patients.

For each hospital, premoistened BBL CultureSwabs (Becton Dickinson, Cockeysville, MD) were used to sample 1-sq ft areas of the floor in the bathroom and adjacent to the bed in CDI isolation rooms and in 2 or 3 randomly selected non-CDI rooms on the same ward as the CDI isolation rooms. Rooms were cultured either during the patient stay or after completion of cleaning after patient discharge. After swab collection, a 2×2 cm premoistened gauze pad was used to sample an adjacent 1-sq ft area for *C difficile* broth enrichment cultures.[8] Cultures were processed for MRSA, VRE, and *C difficile* as previously described.[8] At least 30 rooms were cultured in each hospital.

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Conflicts of interest: A.D. has received research grants from 3M, Steris, and Clorox. C.J.D. has received research grants from Ecolab, Merck, GOJO, Clorox, Steris, and Pfizer.

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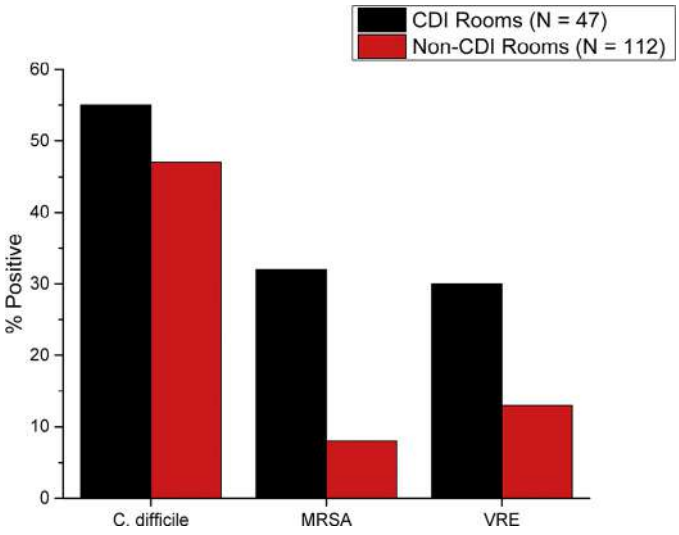

Fig 1. Recovery of *Clostridium difficile*, methicillin-resistant *Staphylococcus aureus*, and vancomycin-resistant enterococci from floors in patient rooms from 5 hospitals in northeast Ohio.

To assess the frequency with which high-touch objects were present on floors, a point prevalence survey was conducted in which observers determined the number and type of high-touch objects on floors in randomly selected patient rooms in each facility. To assess potential for transfer of pathogens from the floor to hands via fomites, research personnel picked up items in direct contact with the floor using either their bare hands (nonisolation rooms) or sterile gloves (CDI or other isolation rooms). Using premoistened CultureSwabs, bare hands were cultured before and after contact with the objects, whereas gloved hands were cultured only after contact.

RESULTS

A total of 318 floor sites were sampled in 159 patient rooms (2 sites per room). As shown in Figure 1, floor contamination was common in CDI and non-CDI rooms, and *C difficile* was the most frequently recovered pathogen. MRSA and VRE were recovered significantly more often from floors in CDI versus non-CDI rooms ($P < .05$), whereas recovery of *C difficile* was similar in CDI and non-CDI rooms ($P = .6$). The frequency of contamination was similar for each of the 5 hospitals and from room and bathroom floor sites. In comparison to rooms cultured during the patient stay (n = 109), rooms cultured after postdischarge cleaning (n = 50) had less contamination with MRSA and VRE (69 out of 536 sites [13%] vs 35 out of 100 sites [35%]; $P < .001$), but not *C difficile* (44 out of 100 sites [44%] vs 114 out of 218 [53%]; $P = .2$).

Of 100 occupied rooms surveyed (n = 10-25 per hospital), 41 (41%) had 1 or more high-touch objects in contact with the floor (range, 1-4 objects per room). The high-touch objects included personal items (eg, clothing, canes, and cellular telephone chargers), medical devices or supplies (eg, pulse oximeter, call button, heating pad, urinal, blood pressure cuff, wash basin, and heel protector), and bed linen or towels (eg, bed sheets, pillow, and towels).

For 31 of the high-touch objects present on floors, bare or gloved hand cultures were collected to determine the frequency of transfer of pathogens to hands after picking up the objects. Of the 31 hand or glove cultures, MRSA, VRE, and *C difficile* were recovered from 6 (18%), 2 (6%), and 1 (3%), respectively.

DISCUSSION

In a survey of 5 hospitals, we found that floors in patient rooms were frequently contaminated with health care-associated pathogens and it was not uncommon for high-touch objects such as medical devices, personal items, and linens to be in direct contact with the floor. Touching these objects frequently resulted in transfer of pathogens to hands. These results suggest that floors in hospital rooms could be an underappreciated source for dissemination of pathogens.

Our findings have several implications for infection control. First, because floors are frequently contaminated, it would be reasonable to educate health care personnel and patients that they should avoid placing high-touch objects on the floor when possible. Second, studies are needed to examine the efficacy of current floor cleaning and disinfecting strategies in removing potential pathogens from floors. In particular, because *C difficile* spores were frequently recovered from floors in CDI and non-CDI rooms, there is a need to identify approaches that are effective in reducing the burden of spores on floors. Sporicidal disinfectants are not typically used on floors. Ultraviolet-C room decontamination devices have been shown to reduce floor contamination with health care-associated pathogens[5]; these devices were used in only 1 of the study hospitals and only in CDI rooms. Finally, studies are needed to assess the potential for other modes of dissemination from floors (eg, shoes, wheelchairs, and other wheeled equipment). A recent study suggested that wheelchairs could be a source of pathogen dissemination in health care facilities.[9]

Our study has some limitations. We only studied *C difficile* spores and 2 gram-positive vegetative pathogens. Additional studies are needed to investigate contamination of floors with gram-negative pathogens and viruses. None of the hospitals used sporicidal agents on floors and therefore the frequency of *C difficile* spore contamination is likely to be higher than in facilities that use sporicidal agents. We did not determine whether non-CDI rooms with positive floor cultures for *C difficile* had recently housed CDI patients. Finally, our results may underestimate the frequency of MRSA and VRE contamination on floors because the culture swab method is less sensitive than the gauze pad with broth enrichment method that was used for *C difficile* cultures.[8]

CONCLUSIONS

We found that floors in patient rooms were frequently contaminated with health care-associated pathogens and demonstrated the potential for indirect transfer of pathogens to hands from fomites placed on the floor. Further studies are needed to investigate the potential for contaminated hospital floors to contribute to pathogen transmission.

References

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