

PRESS RELEASE

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Kaltech Corporation
Division of Hematology and Rheumatology Department of Medicine,
Nihon University School of Medicine

Expectations for the Effectiveness of a Photocatalyst Sterilization and Deodorization Device in Infectious Disease Prevention from Vulnerable People under Actual Use

Kaltech Corporation obtained the positive result from joint research with Nihon University School of Medicine Division of Hematology and Rheumatology Department of Medicine. The research is designed to examine the effectiveness of a photocatalyst sterilization and deodorization device (hereinafter: “the photocatalyst sterilizer/deodorizer”) on infective disease prevention. The result of this research is expected to contribute to the prevention of infectious diseases caused not only by COVID-19 but also by general bacteria, viruses, and fungi under actual use for vulnerable people, such as the elderly with weakened immunity systems and patients with underlying diseases.

- The photocatalyst sterilizer/deodorizer (picture below) was installed in several hospital rooms in Nihon University Itabashi Hospital.
- The number of FN patients in the first and next month before and after installation had decreased. (12→3 persons). Among them, the decrease in the number of elderly people aged 65 and over (10→2 people) was observed, and statistically significant differences were confirmed.
- It is expected to have a certain level of protection against infections for elderly people with weakened immunity systems caused by general bacteria, viruses and fungi, and patients with underlying medical conditions.

*FN: Fever Neutropenia. Neutrophils are generally a type of white blood cell, accounting for approximately 45 to 75% of all white blood cells in the blood. A decrease in the number of neutrophils in the blood reduces control over infections and increases the risk of dying from infection. It is a condition that requires response as an emergency.



Photo 1: Photocatalyst sterilizer/deodorizer installed on the wall of the hospital room



Photo 2: Photocatalyst filter

■ **Comment from Kazuhide Iizuka (Assistant Director, Department of Clinical Laboratory Medicine, Department of Pathology, Nihon University School of Medicine) who oversaw this research.**

As a measure against infections caused by bacteria, fungi, and viruses, it is significant that we have obtained data that shows the expected effectiveness of the photocatalyst sterilization and deodorization device in real space, whereas the previous verification was on laboratory level.

By reducing risks of infection in the hospital room, it may be possible to shorten the length of hospital stay for patients and lessen the price of the drugs administered. Since immunity weakens with age and risk of infection increases, it can be expected to be effective in nursing homes and retirement homes where there are many elder people.

<History>

- In October of last year, Kaltech Corporation and Nihon University School of Medicine, with the cooperation of RIKEN, conducted joint research on the effectiveness of the photocatalyst sterilizer/deodorizer against COVID-19 floating in a closed chamber. The titer of the virus collected after 20 minutes of operation of the photocatalytic sterilizer and deodorizer was below the detection limit, confirming its effectiveness in suppressing infectivity.

- On the other hand, the pandemic of COVID-19 continued, and even though it was not tested and verified under actual use environment, we installed the photocatalyst sterilizer/deodorizer, which was joint researched by Kaltech Corporation and Nihon University School of Medicine with the cooperation of RIKEN, in several hospital rooms of Itabashi Hospital, hoping that it would be useful for infection control even if it does not directly affect patients.

- Around April this year, we noticed that there might be a difference in the number of cases of infectious diseases in the hospital rooms where the photocatalyst sterilizer/deodorizers were installed, before and after the installation, and we compiled various data to explain the results.

* This experiment was conducted in a fixed space and does not show the effect in the actual use environment.

*120-liter sealed chamber, width:60cm, depth:40cm, height:50cm

<Results>

- The photocatalyst sterilizer/deodorizers were installed in several hospital rooms where patients are prone to infections at Nihon University Itabashi Hospital.

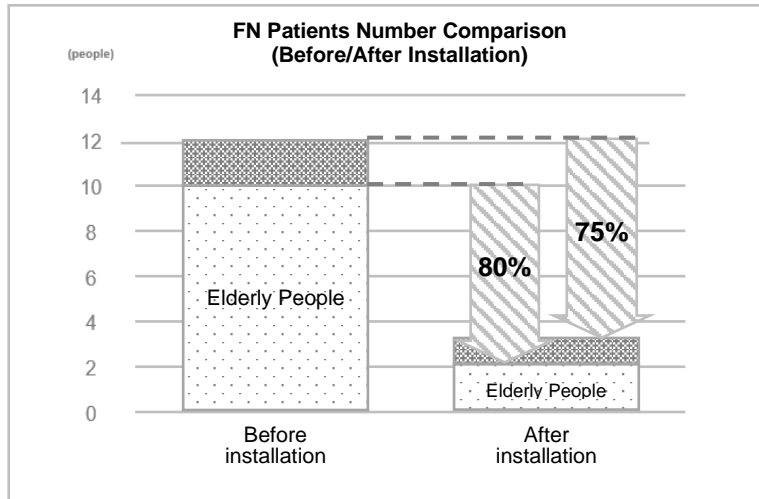
- The number of FN patients in those rooms decreased (from 12 to 3) in the month before and after the installation. Among them, there was a significant decrease in the number of elderly people aged 65 and above (from 10 to 2), confirming a statistically significant difference.

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① Comparison of the number of patients, infected persons, and FN patients during the month before and after the installation of the photocatalyst sterilizer/deodorizers

(Unit: number of people)

Target Period		Patients	Infected patients	FN Patients		Statistically significant difference before and after installation (P value)
					(Elderly)	
Before	1 month from Dec. 11, 2020	65	14	12	10	Infected :P value =0.087(8.7%) Number of FN patients :P value =0.025(2.5%)
After	1 month from Jan. 11, 2020	63	6	3	2	



② Comparison of FN onset by the presence or absence of the photocatalyst sterilizer/deodorizer in hospital rooms in the ward

- [Blue] : Hospital rooms in which the photocatalyst sterilizer/deodorizers to be installed, or installed
- [Pink] : Corridor with a light bulb type disinfectant deodorizer using the same photocatalyst
- [Red] : Number of FN patients

Before Installation (One month beginning 11. Dec. 2020)

1	2	3	5	6	7	Pharma- Dept. ceutical	Break room Nurse	10	11	12	13	15	16	17	18			
														Clean room	Clean room	Clean room		
													2	1	1			
20			20(HC)	Pre- Dept. scription	Nurse station	Electronic medical charts shelf	Lovatory	22	23	25	26	27						
Aisle			1	Hallway								1	1	1		Aisle		
				Storage room							1	1	2					



After Instalation (One month beginning 11. Jan. 2021)

1	2	3	5	6	7	Pharma- Dept. ceutical	Break room Nurse	10	11	12	13	15	16	17	18		
				1										Clean room	Clean room	Clean room	
															1		
20			20(HC)	Pre- Dept. scription	Nurse station	Electronic medical charts shelf	Lovatory	22	23	25	26	27					
Aisle				Hallway											Aisle		
				Storage room							1						

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