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Technology Review



PANASONIC
PURITEE R2

HEALTH TECHNOLOGY ASSESSMENT UNIT
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1. INTRODUCTION

Airway allergic diseases, such as bronchial asthma and allergic rhinitis are characterized by airway inflammation with enhanced eosinophil activity; and the risk of disease development has been shown to increase with the prevalence of atopy. Some urban styles of living are involved in atopic sensitization and enhanced eosinophil activity in the Japanese urban population, probably due to living conditions, such as indoor dampness and poor home ventilation, caused by tight insulation, which increase the exposure to indoor air pollutants, such as respirable mite allergens and tobacco smoke (Kuwahara et al., 2001).

Numerous techniques have been developed over the years with the intention to reduce aerosol exposure in indoor air environment though the most effective method of reducing exposure dose is to remove the source of the contaminant (Peyton, 2005). An air-conditioner with supersonic super alleru-buster and auto refresh DEO launched by Panasonic® claimed that it is able to decompose odours caught by the filter, while effectively cooling and purifying the air as well as deactivating allergens, virus and bacteria.

2. TECHNICAL FEATURES

The Panasonic Puritee R2 air-condition is said to have a 3-in-1 advanced air purifying features with an anti-allergen material called super alleru-buster. The first feature is its strong anti-allergen material (phenolic hydroxyl polymer) catches and inactivates allergens such as dead dust mites and their waste products, pollen and cat dander that could pose great health hazards to humans. This mode of inactivation is systematic i.e. the allergens are caught by the filter; phenolic hydroxyl ions then cling to the allergens which then coated and inactivated them.

The second feature is the path breaking blue fin condenser technology which has a life span that is thrice that of other condensers. It uses a special anti rust coating that withstands damage from exposure to salty air, wind, dust and other corrosive factors, and it is highly energy efficient with low electric consumption.

The third feature is its air purifying system with a supersonic wave that collects dust particles for faster and efficient purification, as well as ensuring constant flow of naturally healthy air by generating rich negative ions. The air purifying system together with the blue fin condenser makes the device last three times longer than normal condenser. The supersonic air purifying system incorporated in the indoor unit of the air-conditioners generates supersonic waves, which works in combination with the filter to trap dust and dirt in the air for faster and efficient purification. The auto refresh DEO filter decomposes odour particles within 30 minutes after the blue light emitting diode (LED) illumination lights up each time the unit starts operating (www.strategy.com).

3. OBJECTIVE

To determine the safety and effectiveness of Panasonic Puritee R2 in deactivating bacteria, virus and fungus.

4. METHODOLOGY

A systematic search was carried out using scientific database PubMed, Ebsco and the Health Technology Assessment databases. In addition, searches using the general engine Google and Ebsco were also carried out. The keywords used, either single or in combinations, were "super alleru buster", "blue light emitting diodes", "virus", "bacteria", "allergen", "air Condition", "air filter", "air purifier", "sound wave", "supersonic wave", "house mites", "mold spore", "animal diodes", "polymer", "dust mites", "phenotic hydroxyl polymer", "phenol hydroxyl ion", "air neutralizing", "auto refresh DEO", "blue coated condenser", "air purifying", "safe*" and "effective*".

5. RESULTS

5.1 Safety

There was no study found on the safety aspect of this technology.

5.2 Effectiveness

There was no published scientific evidence on Panasonic Puritee R 2 found. There was also no published scientific evidence on the anti-allergen material, phenotic hydroxyl polymer, used in the air-condition device.

However, there were few studies on air conditioning unit, indoor air purifiers and airborne dust mite allergen. Air-duct cleaning of heating-ventilation-air conditioning systems has been reported to decrease levels of air borne fungi in residences (Garrison et al., 1993). Lintner and Brame (1993) found that air-conditioning significantly reduced allergens (fungal) detected in dust samples. They also found regular use of central air conditioning also will usually control humidity sufficiently to reduce house-dust mite growth.

A review by Peyton (2005) stated that reducing the indoor relative humidity and airborne mold spore level using high-efficiency particulate arrestance (HEPA) filtration will improve the indoor air quality in the home and work place. A retrospective study in Singapore mentioned that indoor aeroallergen sensitization is the major associated factor with clinical allergic rhinitis in children in Singapore. Specific patterns of indoor allergen sensitization are associated with the presence or absence of air-conditioning in the homes of symptomatic children with respiratory allergy in a tropical environment. Mold sensitization, prevalent in 19% of

Singaporean overall children population, is significantly increased (49%) in the group without home air-conditioning (Iancovici et al., 2004). Kidon et al (2004) in his review mentioned that the use of room high efficiency particulate air (HEPA) filters might reduce airborne levels and when these unit are placed in living rooms, air born levels of cat and dog allergen have been shown to decrease by almost 90%.

6. CONCLUSION

There is no evidence on safety and effectiveness of Panasonic Puritee R2 in deactivating bacteria, virus and fungus. However, there were few studies on air-conditioning unit that reduces the number of aeroallergens.

7. RECOMMENDATION

Further research and evaluation should be done on the Panasonic Puritee R2 air conditioning system to evaluate its safety and effectiveness in deactivating bacteria, virus, fungus and other allergens.

8. REFERENCES

Garrison RA, Robertson LD, Koehn RD, Wynn SR (1993). Effect of heating-ventilation-air conditioning system sanitation on airborne fungal populations in residential environments. *Ann Allergy*. Dec;71(6):548-56

<http://www.strategy.com>

Kidon MI, See Y, Goh A, Chay OM, Balakrishnan A (2004). Aeroallergen sensitization in pediatric allergic rhinitis in Singapore: Is air-conditioning a factor in the tropics? *Pediatric Allergy & Immunology*. Aug;15(4):340-343

Kuwahara Y, Kondoh J, Tatara K, Azuma E, Nakajima T, Hashimoto M, Komachi Y (2001). Involvement of urban living environments in atopy and enhanced eosinophil activity: potential risk factors of airway allergic symptoms. *Allergy*. Mar;56(3):224-30

Lintner TJ, Brame RA (1993). The effects of season, climate, and air-conditioning on the prevalence of *Dermatophagoides* mite allergens in household dust. *J Allergy Clin Immunol*. 91:867-7

Peyton AE (2005). Improving indoor environments: Reducing allergen exposures. *J Allergy Clin Immunol*. 116(1):122-126

EVIDENCE TABLE

Aspect: Effectiveness

No	Author, Title, Journal, Year, Vol, Page No	Study Design, Sample Size, Follow Up	Outcomes & Characteristic	Level Of Evidence	Comments
1.	<p>Peyton A Eggleston</p> <p>Improving indoor environments: Reducing allergen exposures</p> <p>Journal of Allergy & Clinical Immunology. July 2005, 116(1):122-126. [Abstract]</p>	Review	The use of HEPA filters might reduce airborne levels when these units are placed in living rooms, airborne levels of cat and dog allergen have been shown to decrease by almost 90%.	Poor	
2.	<p>Kidon MI, See Y1, Goh A, Chay OM, Balakrishnan A</p> <p>Aeroallergen sensitization in pediatric allergic rhinitis in Singapore: Is air-conditioning a factor in the tropics?.</p> <p>Pediatric Allergy & Immunology. August 2004 , 15(4):340-343. [Abstract]</p>	<p>A retrospective cross-sectional analysis through medical records (study in Singapore).</p> <p>Aaeroallergen skin prick testing (SPT) in the outpatients clinic (children) from 2001-2002.</p>	Indoor aeroallergen sensitization is the major associated factor with clinical allergic rhinitis in children in Singapore. Specific patterns of indoor allergen sensitization are associated with the presence or absence of air-conditioning in the homes of symptomatic children with respiratory allergy in a tropical environment. Mold sensitization, prevalent in 19% of our overall children population, is significantly increased in the group without home air-conditioning (49%).	Poor	
3.	<p>Lintner TJ, Brame KA.</p> <p>The effects of season, climate, and air-conditioning on the prevalence of Dermatophagoides mite allergens in household dust.use hold dust.</p> <p>J Allergy Clin Immunol 1993. 91 : 867-7 (Abstract) [Abstract]</p>	Laboratory study on Dermatophagoides pteronyssinus allergen and D. farinae allergen measured in 536 dust samples in 424 homes across the United States.	<p>There was a significant ($p < 0.001$) interaction between air conditioning and season.</p> <p>Distinct seasonal fluctuations exist of D. pteronyssinus and D. farinae mite populations. Differences in the microclimate within homes may have a dramatic affect on mite populations.</p>	Poor	

No	Author, Title, Journal, Year, Vol, Page No	Study Design, Sample Size, Follow Up	Outcomes & Characteristic	Level Of Evidence	Comments
4.	<p>Garrison R.A, Robertson L.D, Koehn R.D, Wynn S.R.</p> <p>Effect of heating-ventilation-air conditioning system sanitation on airborne fungal populations in residential environments.</p> <p>Ann Allergy. 1993 Dec; 71(6):548-56. [Abstract]</p>	<p>Laboratory study on 8 residential HVAC systems in 6 homes and 7 HVAC systems in 5 homes in winter and summer were sampled to determine fungal colony. 2 houses were as control.</p>	<p>After 8 weeks sanitation the study houses demonstrate reduction 92% (winter) and 84% (summer). No reduction in control.</p> <p>Heat-ventilation-air conditioning (HVAC) may be effective tool in reducing airborne fungal populations in residential environments.</p>	<p>Poor</p>	