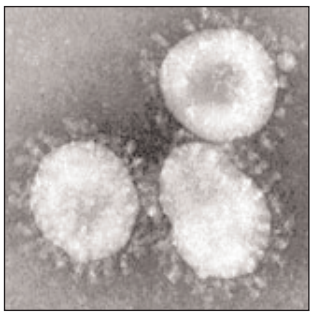
Hong Kong Hospital Authority selects IQAir® advanced filtration systems for the fight against SARS

In February of 2003, newspapers began reporting a rapidly spreading atypical pneumonia. Now identified as severe acute respiratory syndrome or SARS, this highly contagious condition is caused by a new coronavirus for which there is no specific antiviral treatment. While the epicentre of the outbreak was China, the disease spread quickly across Asia and North America (especially Canada) with a total of 32 countries and areas eventually reporting cases.



Coronavirus

Until August 2003, an estimated 8422 cases have been reported – with a total of 916 deaths attributed to the syndrome. In terms of profession, health-care workers (HCW) were particularly affected with a total of 1725 individuals (20% of the total) becoming infected. Adding to the immense human cost, the SARS outbreak hit many economies very hard leaving them severely damaged as tourism and other travel related industries took a nose-dive. Estimates of the financial cost of SARS have varied from a conservative figure of US$30 billion according to the World Health Organization (WHO) to US$ 150 billion globally. Some experts noted that even this high figure is likely to be a gross underestimate. Thus, the effects of SARS are now regarded as the affected regions' own "September 11" and the aftershocks are still unfolding.

Will SARS Return?

In an unprecedented effort to solve the SARS mystery, the WHO, the Centers of Disease Control (CDC) and many other organisations have brought hundreds of people together. On July 5, 2003 the last two countries (China and Taiwan) were finally taken off the list of areas with recent local transmissions. At this moment in time the most pressing question is whether SARS will return. Like the Ebola virus, the SARS virus could hide in some animal or environmental reservoir, only to resurface once the conditions again become ripe for the spread to humans. According to the WHO, "SARS might also behave like many other respiratory diseases of viral origin, dying out as heat and humidity rise and returning when the season turns cooler."

Preparedness is the Best Defence

Much like other respiratory illnesses, SARS is spread by close contact, when a person infected with SARS contaminates the surrounding air with tiny droplets of infected matter. Someone in close proximity of the infected person can then become infected by breathing in the contaminated air. However, scientists are also considering other possibilities of transmission. According to the CDC, "it is possible that SARS can also spread more broadly through the air". Since there is no specific antiviral treatment for SARS, the most effective strategy is control. While it is the WHO's first objective to seal off opportunities for international spread of this deadly disease, many health-care institutions are looking for additional infection control measures that will help them to contain infections in the event that the corona-virus once again flares up in an outbreak.

The Hong Kong Case

One of the institutions that was particularly keen to implement special engineering controls as an additional precaution strategy in the fight against SARS is the Hong Kong Hospital Authority (HKHA). The authority currently manages 43 public hospitals, 47 specialist outpatient clinics and 13 general outpatient clinics. During the SARS crisis Hong Kong was one of the worst affected areas with 1755 reported SARS cases (376 of which concerned health-care workers), resulting in a total of 300 deaths. In view of these huge losses, the HKHA was determined to find a way to effectively contain the SARS virus in case the disease should resurface.

The Selection Process

In order to find the most efficient, reliable, flexible and cost effective solution the Electrical and Mechanical Services Department (EMSD) of the Hong Kong Government performed rigorous tests on behalf of the HKHA. They evaluated the suitability and performance of many filtration systems, including IQAir®. With the help of a laser particle counter the EMSD tested the actual filtration efficiency of each filtration system.

Mark Lau of the EMSD testing the actual filtration efficiency of a non-certified air cleaner with a laser particle counter. The majority of air cleaners failed the test.

Assessing the actual filtration efficiency of an air cleaner with a laser particle counter.

The efficiency tests quickly verified that most of the systems fell well short of removing airborne particulates with an actual efficiency in excess of 99.97% for particles of 0.3 µm and larger. With it's certified and independently type-tested filtration efficiency IQAir® passed this test.

Each IQAir® HEPA filter system is individually tested for filtration efficiency and air delivery. The actual test results are documented on a numbered test certificate.

After the preliminary selection process, it was the EMSD's aim to select an infection control system that could be put into action in a matter of minutes and that would be able to effectively limit the threat of airborne disease transmission from a SARS patient to health-care workers by providing reliable and certified actual filtration performance.

Thanks to the professional support of a Hong Kong based authorised IQAir® dealership and IQAir®'s previous experience in the field of hospital infection control (see previous IQAir® press release "Decentralised airborne infection control in health-care facilities"), IQAir® was able to develop a tailor-made infection control solution for the Hong Kong Hospital Authority.

Testing the IQAir® in location. Artificial smoke is generated on a hospital bed and then captured at source with the help of the IQAir® FlexVac's flexible suction arm.

After weeks of testing and the installation of several trial systems the HKHA finally chose IQAir® as the only filtration solution for SARS patient rooms. To equip the scores of hospitals under the authority of the HKHA, several hundered systems are required. The selected IQAir® filtration system consists of the IQAir® HealthPro® Plus/250 model connected to the IQAir® FlexVac mobile source capture system and a special air exhaust that enable the filtered air to be directed.

The customised IQAir® filtration solution for the Hong Kong Hospital Authotrity combines an IQAir® filtration system with the FlexVac source capture kit.

In the case of a SARS emergency, the self-contained mobile IQAir® filtration system can immediately be positioned next to the SARS patient's bed. The flexible suction arm is positioned near the patients face to capture airborne droplets that are expelled by coughing and sneezing. The contaminated air is then drawn into the system and filtered in a 3-stage filtration process. At the final filtration stage IQAir®'s independently type-tested HyperHEPA® filter will remove even the tiniest of airborne particulates, including the SARS virus, with a minimum efficiency of 99.5%. As a result the risk of infection within the patient's room can be greatly reduced, thus providing a safer working environment for health-care personnel and reducing the possibility of spreading of the disease.

Taiwanese IQAir® display

It is clear that vigilance for SARS must be maintained, because resurgence of the virus is possible. As a world leading manufacturer of mobile air cleaning systems IQAir® feel honoured and privileged that we are able to play such an important part in providing professional air cleaning solutions for the fight against SARS. We sincerely thank all those individualy who have contributed to make this success possible. JKH

Medical Application Areas for IQAir® Systems:

Due to their unique adaptability, reliability and certified filtration efficiency, IQAir® systems cover a broad spectrum of applications in health-care facilities:

- Bone marrow transplant units
- Organ transplant units
- Burn units
- Critical care facilities
- Intensive care units
- Isolation areas (e.g. TB/SARS-isolation)
- Dental clinics and dental laboratories
- Geriatric units
- Neonatal intensive care units
- Pulmonary Diseases
- Paediatric wards
- Oncology wards
- Haematology
- Microbiology labs
- Laser surgery fume and odour controls
- Operation theatres and anterooms
- Pathology theatres
- Pharmacies
- Computer and data storage areas
- Smoking areas
- Fresh air filtration / ventilation
- Sanitary facilities
- Waiting rooms
- Emergency rooms

IQAir® systems are in use at many world-leading health-care and research institutions, including:

Bayside Medical Center, West Springfield, MA, USA
Beijing Friendship Hospital, Beijing, China
Beijing University People's Hospital, Beijing, China
Beijing Union Medical College Hospital, Beijing, China
Blackrock Clinic, County Dublin, Ireland
Cardarelli Hospital, Neaple, Italy
Duke University Medical Center, Durham, NC, USA
German Allergy & Asthma Society, Bonn, Germany
Hollister Research Center (Univ. of California) Santa Barbara, USA
Harvard University, Cambridge, USA
Holy Cross Hospital, Silver Spring, MD, USA
Hong Kong Hospital Authority, Kowloon, Hong Kong
Interfaith Medical Centre (Psychiatric Ward), New York, USA
Kamillianer Krankenhaus (für Allergien), M.-Gladbach, Germany
King's College Hospital (Histopathology Dept.), London, UK
Long Island College/University Hospital, New York, USA
Lungenliga (Lung Association), Zürich, Switzerland
Merlin Park Regional Hospital (Operation Room), Galway, Ireland
Massachusetts Institute of Technology (M.I.T.), Boston, USA
National Cancer Institute, Bethesda, Maryland, USA
New York University Downtown Hospital (Burn Ward), NY, USA
Our Lady's Hospital for Sick Children (Univ. Coll. Dublin), Ireland
Oklahoma Medical Research Foundation, Oklahoma City, USA
Ospedale Israelitico, Rome, Italy
Ospedali Vitofazzi di Lecce, Lecce, Italy
Pamela Youde Nethersole Eastern Hospital, Hong Kong
Pennsylvania State Univ. (Applied Research Center), PA, USA
Rockford Memorial Hospital, Rockford, Illinois, USA
Royal Free & Univ. Coll. Med. School (Oncology), London, UK
Sanxi People's Hospital, Sanxi, China
Shijiazhuang Hospital, Shijiazhuang, China
St. Marien Krankenhaus, Siegen, Germany
St. Vincent Hospital (Oncology & Liver Transplant), Dublin, Ireland
Sunshine Dental Practice, Diamond Bar, CA, USA
The University Hospital Cincinatti, Ohio, USA
Universitair Ziekenhuis Antwerpen, Edegem, Belgium
University Clinic Bonn, Germany
Univ. Coll. Hosp. Galway (Haematology, Neonatal, Oncology), Irel.
Univ. Coll. Davis, (Primate Research Center), Davis, CA, USA
University Dental Clinic Halle, Germany
University of North Florida, Jacksonville, FL, USA
University Health Network, Toronto, Canada
Universtiy of Connecticut (Fine Arts Dept.), Storrs, CT, USA
University of Colorado, Denver, Colorado, USA
University of Texas, Austin, TX, USA
United Christian Hospital, Kowloon, Hong Kong
Virga Jesseziekenhuis, Hasselt, Belgium
Wartburg Klinik, Eisenach, Germany
Washington Univ. (HHMI, Clinical Sciences), St. Louis, MO, USA
Wayne State University, Detroit, MI, USA
ZentralKrankenhaus (Internal Medicine), Bremen, Germany
Zürcher Höhenklink Wald, Zürich, Switzerland

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