Clean Ventilation Systems – Never More Essential

Richard Norman, Managing Director of Indepth Hygiene Services Limited, the UK's leading company for specialist cleaning of ventilation systems talks about the importance of ensuring they are thoroughly cleaned.

There has never been a previous time when those responsible for the maintenance of ventilation systems had more reason to ensure they are maintained in a clean and safe condition. On a fundamental level the National Health Service is charged with the responsibility in its own constitution to ensure "*patients are treated by an organisation that provides its services in a clean and safe environment*". The very air that patients, staff and visitors breathe must be safe and unpolluted. Since the essential functions of a ventilation (air conditioning) system is to circulate clean safe air it is indisputable that those with a particular responsibility for maintaining ventilation systems should ensure that all possible steps are taken to do just that.

In order to comply with Building Regulations healthcare premises, particularly hospitals, are becoming more airtight. The most recent changes to the Regulations require buildings to be "better sealed and more airtight." So often that results in warmer, stuffier conditions. Air conditioning is therefore the only solution to redressing the situation by providing clean, filtered air.

Unfortunately it is my company's experience that with a few exceptions air conditioning systems are not being given the priority attention they warrant by those responsible for maintaining comfortable, safe conditions. We frequently encounter systems where the ducting retains very measurable deposits of dust and debris. Invariably these systems show further evidence that they have not been cleaned; no access panels have been fitted in the ductwork to show that probably no duct cleaning has been carried out. Yes, my company like other contractors carry out ductwork cleaning using mechanical brush units but for a totally thorough deep clean panels should be installed, particularly near any bends, to ensure all surfaces are effectively cleaned throughout the system.

Dr Ghasson Shabha, Course Leader at the School of Property Constructions and Planning at Birmingham City University has published extensively his findings on the link between uncleaned air conditioning systems and the spread of HCAI. These studies are ongoing but he firmly maintains that temperature and humidity conditions typically found in ventilation ducting provide excellent opportunities for these bugs to thrive. As he stated in Facilities Management World "*MRSA is a frequent component of hospital dust which can easily circulate through the air supply and return via ventilation systems which poses a major risk of cross infection. The situation has been exacerbated due to the need to conserve and optimise energy efficiency leading to a significant reduction of natural ventilation from fresh air*".

It is known that environmental conditions can affect the survival and presence of micro-organisms. Humidity levels are also known to beneficially influence microbial survival and growth of mould, mildew and bacteria on the internal surfaces of ductwork. This leads to an enhanced production of allergens. The components of dust and debris within air conditioning systems will include human hair and skin fragments. A combination of temperature and humidity levels typically found in air conditioning systems and the presence of materials conducive to the development of micro-organisms underline the importance of having ductwork systems professionally cleaned. Without cleaning there will be a steady build-up of dust and organic compounds within ducting to provide ideal nutrients for micro-organisms such as MRSA and C difficile to thrive.

Of course, it is not only ductwork cleaning which can play an important role in the fight against HCAI. Selection and maintenance of air filters is also an important factor. Dust and particulates can pass through poor quality filters. Installation of high efficiency (HEPA) filters play an essential role in combating the spread of infection.

The need for action was further underlined this year. Following a National Resistance Alert in January concerning the number of NHS patients returning from medical treatment in India carrying NDM-1 further concern has been expressed in the Lancet and National Press about the sharp increase in the incidence of infection from this source.

Dr Richard Hastings, a leading Micro-biologist has also stated "*There is no doubt in my mind that more drastic action has to be taken to combat hospital bugs and this is even more paramount now NDM-1 has entered UK hospitals*."

It is believed that UK healthcare will be increasingly challenged because these organisms are resistant to all but very few antibiotics. At the same time it has strengthened the importance of ensuring that all potential transmission routes are identified and appropriate action taken. As I have already explained, there is plenty of evidence to show that micro-organisms can be transmitted and spread through ventilation ductwork systems.

What a pity it was that so little of the extra monies recently made available to the NHS for a 'deep cleaning' drive was devoted to the cleaning of air conditioning systems. There was certainly evidence of more cleaning of ledges, rails and bedframes for example, and greater exhortations for more regular handwashing, but no evidence I have seen of some of this money going to the cleaning of air conditioning systems.

It is my experience that little acknowledgement has been given to the growing evidence of the link between the failure to carry out ventilation ductwork cleaning and the incidence of HCAI. Admittedly I have seen an increase in the awareness among Estates management of the importance of ensuring system filtration is fully effective.

It is indisputable that, improved filtration can play an important role in reducing levels of contamination in system ducting and, as a result, a reduction in the prevalence of airborne particulates in the circulated air. However, even where better filters have been introduced to improve the indoor air quality the condition of the ducting system beyond the filters has frequently been ignored, which Dr Shabha has shown can provide breeding conditions for micro-organisms.

Perhaps it is the concern that to access the ducting for carrying out a cleaning programme will involve disruption and inconvenience which deters managers from implementing a comprehensive system improvement programme. Whilst I readily acknowledge that special arrangements have to be made for access to ducting that often runs above ward space, it is my experience that disruption can be kept to a minimum by careful planning of the deep cleaning programme which fully acknowledges the need to put continuing patient care as an absolute priority.

The Department of Health's guidelines embodied in Health Technical Memorandum HTM 03-01 provides clear advice and guidance on the legal aspects of the need to maintain ventilation systems so that they do not present a potential threat to the health and wellbeing of all hospital occupants, staff, patients and visitors alike. These guidelines point out the dangers of increased health risks should there be a failure to maintain ventilation systems which, it recommends, should be inspected at least annually. Where ventilation systems are serving facilities requiring the highest standards of air cleanliness it is recommended that they be visually inspected quarterly and subjected to performance analysis.

There is a further reason why ventilation systems should be viewed in their entirety – the Government's commitment to reduce energy use throughout the UK embodied in the CRC (Carbon Reduction Commitment) Energy Efficiency Scheme. It has been well documented that Heating, Ventilating and Air Conditioning can account for 70% of an organisation's energy costs. A claim made by the Carbon Trust, which was set up to provide specialist support to business and the public sector to help cut carbon omissions and save energy, is that inefficient and dirty ventilation systems can increase energy consumption by up to 60%. It is the condition of the ducting, coils and filters which puts the main resistance on the fan, and the fan is a major user of energy. So there is a further very good reason why these systems should be reviewed in their entirety not just piecemeal – the need to cut energy costs.

As never before, it is clearly incumbent on those charged with providing safe, hygienic conditions in hospitals to include ductwork cleaning of ventilation systems not only as an essential part of their attack on the incidence of healthcare associated infections but also as a contribution to the requirement to save energy costs.

My company will provide a comprehensive review of your ventilation systems providing both a written and photographic report that will give you a clear appraisal of the presence of any healthcare risk, quite **free of charge**.

For further information call Indepth Hygiene Services on 020 8661 7888 or email ductclean@indepthhygiene.co.uk.

Internal duct surfaces showing accumulation
of dust and debris