

Mr John Parkin - *The Importance of Infection Control to the NHS*

Chief Engineer of NHS Estates Department of Health. As Head of the Agency's Engineering and Science Group, he is involved in a number of initiatives related to the control of infection in the built environment. NHS Estates are keen to encourage innovation in the design, operation and maintenance of engineering services that will contribute to the reduction in risks of cross-infection.

Control of Infection

"Progress on Infection Control is of the egg-and-chicken variety: our understanding of what is possible runs ahead of the technology- then the technology improves and new possibilities open up". Attributable to Craig Mackintosh, Wirral Medical Microbiological, Clatterbridge Hospital, Wirral.

The subject of the control of infection is taken very seriously by the Department of Health and NHS Estates, in our aim to constantly reduce the risk of infection to patients, staff and the public. These risks are primarily attributable to hospital acquired infections which are described as infections that are neither present nor incubating when a patient enters hospital. They vary from discomfort for the patient to prolonged or permanent disability and a small proportion of patient deaths each year.

Some 75% of hospital acquired infections are those which affect the urinary tract, surgical wounds, the lower respiratory tract skin and the bloodstream, the other 25% being due to person to person spread, environmental contamination and airborne transmission with this route being seen as minor. The air borne route in the main being due to droplet nuclei (5 μm or smaller) which can be dispersed widely without settling. Larger droplets, which tend to settle within less than a metre, are considered to be an extension of contact spread.

Poor hygiene is not the only source of hospital acquired infection (HAI). Airborne infections, although forming the minority of hospital acquired infection, undoubtedly occur and we need to tackle this important issue.

In recognising the importance of this issue, NHS Estates commissioned a report into Hospital Ventilation and its impact on infection control. This reported identified a number of areas for further investigation, including isolation room design, theatre design, theatres for the future, testing and commissioning of operating theatres and reviewing maximum air flow requirements for theatres. We are now considering how to take a number of these important research projects forward.

However, ventilation is not the only solution to reducing HAIs and we must work in partnership with clinical and nursing colleagues to try and reduce all kinds of infection. The recent National Audit Office (NAO) report considered this issue and concluded among other things that Acute NHS Hospital Trusts should focus attention on ways of improving the management and control of hospital infection.

National Audit Office report

A recent National Audit Office Report on the Management and Control of Hospital Acquired Infection in Acute NHS Trusts in England considered that:

- a. about nine per cent of inpatients have a hospital acquired infection at any one time, equivalent to at least 100,000 infections a year

- b. the costs of treating hospital acquired infection, including extended length of stay, are difficult to measure with certainty, but may be as much as £1,000 million each year
- c. not all hospital-acquired infection is preventable, since the very old, the very young, those undergoing invasive procedures and those with suppressed immune systems are particularly susceptible:
- d. the extent to which HAI are controlled through prevention, detection and containment measures in Acute NHS Hospital Trusts in England (NHS Trusts)

In their conclusions the NAO highlighted that there were many examples of good practice to prevent and minimise the problems of HAI in individual Trusts and that the Department of Health had launched a number of initiatives recently to improve HAI prevention and control techniques. In addition the NAO noted that in many Trusts there was a mismatch between what was expected in controlling hospital infection and providing sufficient resources to achieve that expectation.

They also found a lack of evidence based guidelines on the cost effectiveness measures to reduce HAI and welcomed the Nosocomial (hospital acquired) Infection National Surveillance Scheme and the Department of Health's new Clinical Governance and Controls Assurance initiative which, among other things, focus attention on ways of improving the management and control of hospital infection.

Specialist Hospital Ventilation

Ventilation is used extensively in healthcare premises for primary patient treatment in operating theatres, intensive treatment units and isolation suites. It is also installed to ensure compliance with quality assurance of manufactured items in pharmacy and sterile supply department and to protect staff from harmful organisms and toxic substances, for example in laboratories.

Ventilation is also provided for the comfort of the occupants of buildings however more specialised systems are provided to closely control the environment and air movement in order to contain, control and reduce hazards to patients and staff from airborne contaminants.

Ventilation systems in themselves present little danger to patients or staff; however, they do possess the ability to transmit hazards arising from other sources to large numbers of people. The danger may not become apparent until many patients and staff have been affected.

The sophistication of ventilation systems in healthcare premises is increasing. Patients and staff have a right to expect that such systems will be designed, installed, operated and maintained to appropriate standards enabling ventilation to be provided reliably and safely.

Built Environment

Ways of using the built environment to minimise infection, whatever the source need to be considered along side those of clinical infection control. These would include providing comfortable conditions with respect to temperature, humidity and a safe environment which would not support the growth of bacteria and allows staff to provide effective clinical care: for example, correct bed spacing and hand washing facilities.

Challenges

Evolving clinical practice presents new challenges in infection prevention and control, which need continual review and assessment. The Department of Health has developed several initiatives within an overall strategy to enable the NHS to meet these challenges.

Controls Assurance

Advice has been issued to the NHS stressing the need to strengthen infection control arrangements and processes. Because of the importance of the issue, the most senior people in the NHS organisations concerned - Chief Executives of NHS Trusts and Health Authorities - have been made responsible for ensuring the provision of effective infection control arrangements.

To underpin this accountability, the Department of Health has launched standards and a set of assessment criteria for infection control in hospitals. This forms part of a "Controls Assurance Framework" designed to provide evidence that NHS organisations are working towards meeting their objectives and protect patients staff and the public against the risk of all kinds of infection.

Information related to Controls Assurance is available at www.doh.gov.uk/riskman.htm. A circular (HSC 2000/002), setting out an action plan for infection control, was issued to the service in February 2000.

Developing further guidance related to infection control

The Department of Health is also in the process of developing new guidance on infection control, which will not only look at building and room design, but also at how to ensure staff are aware of infection control best practice.

Obviously any new legislation, British/European standards with respect to infection control which has an impact on either the built environment or in controlling infection is being incorporated, where appropriate, into any guidance we produce.

R&D

Research and development is a key element of the strategy to encourage the emergence of new technologies/methodologies to reduce Hospital Acquired Infection.

Providing advice on the built environment in the NHS, NHS Estates is also involved in the funding of two research projects led by the University of Leeds which are looking at the use of:

- a. **Ultraviolet germicidal irradiation light (UVGI)** in hospital buildings. While the focus of the overall research programme is on the control of specific pathogens Methicillin Resistant Staphylococcus Aureus (MRSA) and Mycobacterium Tuberculosis (MTB) it is proposed that this initial pilot study will concentrate on the disinfection of airborne micro-organisms in general within the hospital ward setting;
- b. **Air Ionisation** This study follows on from, and complements the UV light project and is designed to investigate the impact of negative ionisation on the disinfection of air and will involve both theoretical and hospital based field trial work.

With a large modernisation programme for the NHS, the NHS Estates is keen to support innovative solutions to the problem of airborne infection that reflect the best value aims of the Department of Health. The outcomes of these two research projects will be closely monitored to ensure that benefits to the NHS arising from this activity are realised.

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TB and MRSA Control

An Alternative Approach to Infection Control

Symposium & Exhibition

The first symposium on the application of engineering measures to control tuberculosis and airborne nosocomial (hospital acquired) infections, including methicillin resistant *Staphylococcus aureus* (MRSA)



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