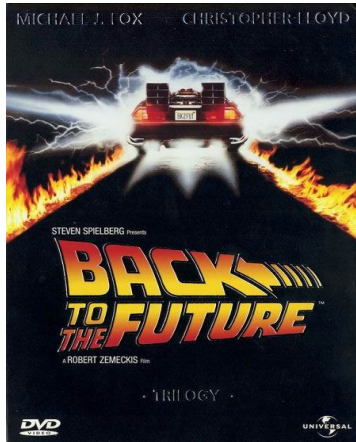


Good For You

A Newsletter produced by Dr. Norman Simmons, CBE,



MRSA-What Can We Do Now?

Fourteen Suggestions for Action

The ways that *Staphylococcus aureus* spreads were determined more than 40 years ago, as were methods to limit the spread. The discovery then of methicillin and other anti-staphylococcal agents highly effective in the treatment of infected patients removed the stimulus to introduce effective control systems. These were regarded as costly and unnecessary. The rise of MRSA, which are merely strains of *Staph aureus* resistant to the antibiotic methicillin, has unmasked the deficiencies. However, we know what to do to reduce transmission and it is more than washing hands and cleaning floors, which, though desirable, are likely to have only marginal effects on transmission rates. If the lessons learned all those years ago are not put into effect things will get worse.

How Much MRSA Infection is there?

Surprisingly, the exact amount of MRSA infection in British hospitals is unknown. The figures generally quoted in the Press relate either to the number of incidents of MRSA found in the blood or the proportion of *Staphylococcus aureus* sent to reference laboratories that are found to be methicillin-resistant. There has been no recent survey of overall hospital infection. Urgent steps should be taken to discover the true figures.

The highest MRSA infection rates appear to occur in tertiary referral hospitals. In the first instance efforts to reduce MRSA infection should be concentrated in the

hospitals with the highest numbers of MRSA infections.

Recommendation 1. A centrally funded surveillance study should be carried out to determine the overall MRSA infection rate in British hospitals.

The way they spread.

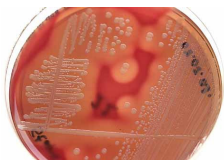
Between 30 and 50 per cent of normal people carry *Staphylococcus aureus* in the nose, but only a few bacteria are shed directly from the nose into the air. Staphylococci are also carried on the skin and more than 10 per cent of normal people carry them on the on the skin of the perineum. A normal person sheds an entire layer of the superficial skin surface every day or two. Tiny skin particles, each

between 10 and 18 microns in diameter and carrying up to 10 bacteria are released. It is these skin particles, principally those from the perineum, drifting in the air that spread staphylococci, including MRSA.

Carriers vary greatly in the number of particles and staphylococci that they shed, some shedding very few and others, so called '*dispersers*', relatively enormous numbers. Even now there is no simple reliable method to distinguish dispersers from other carriers.

Skin particles are found in large numbers in dust, but simply collecting the dust from hospital floors is insufficient to break the chain of transmission, as recontamination can be very rapid.

Staphylococci are transferred on the hands from the nose to other parts of the body and clothing. Blankets, bedding and pillows become heavily contaminated after three or four days and bed making throws the bacteria in the air. Bacteria can also be transferred on a variety of inanimate objects, from books to toys.



Breaking the chain.

Isolation- the separation of carriers and the infected patients from the uninfected –is the key to controlling the spread of MRSA. This cannot be achieved when both the MRSA positive and negative patients are kept together on an open ward. No amount of hand washing or floor cleaning is enough to completely prevent transmission. All positive patients must be cared for in dedicated isolation accommodation. Although open wards have been used for this purpose they probably allow reinfection of patients. For this reason single rooms should be provided.

However, the provision of single rooms for MRSA positive patients only will not be enough. With the present patient management systems and open Nightingale wards, carriers, some of whom will be dispersers, may be admitted, shed their bacteria into their environment and infect other patients before they are detected. This is a special risk in tertiary referral hospitals, i.e. those that receive many of their patients from other hospitals for highly specialised care. Studies carried out in the 1960s showed that infection rates are dramatically reduced when patients are cared for in single rooms. Dividing large wards into much smaller units and nursing patients in groups of 6 or less can also reduce infection rates. Currently, transmission in private hospitals, where patients are, for the most part, cared for in single rooms, is much lower than in hospitals with large open wards.

Already at least one new NHS hospital is being planned in which about 80 per cent of the patients will be in single rooms and the remainder in small groups.

Recommendation 2. All MRSA positive patients and carriers must be cared for in a single room isolation unit, which must be provided in each major hospital as soon as possible. The size of units should be determined by the size of the problem in the hospital concerned. It should be separately staffed and the staff well-trained in infection control.

Recommendation 3. New hospitals should be constructed to isolate as many patients from each other as possible. This will necessitate the provision of enough single rooms to care for the majority of patients and certainly enough for the care of all surgical patients. The

remaining accommodation, which may be used for patients at low risk, should be in small units of 6 beds or less.

Recommendation 4. Wards in existing hospitals should be examined to see how the maximum number of single rooms and units of six beds or less could be provided.

Stop moving patients.

“Especially dangerous are the staphylococci introduced into the ward by patients infected in another part of the hospital, or in other hospitals, because these are likely to be strains with epidemic propensities. We know of many examples of the introduction of virulent, and highly antibiotic-resistant, strains into new hospitals and new wards by the transfer of patients who had been the victims of hospital infection elsewhere.

Williams, Blowers Garrod and Shooter, Hospital Infection Lloyd-Luke, 1966



Since 1966 new systems of patient management have been introduced to maximise bed use. These systems are not compatible with good infection control. Patients are often moved several times during a single hospital admission and they carry their bacteria with them. Moving patients from ward to ward or room to room to maximise bed usage facilitates the spread of staphylococci including MRSA.

Recommendation 5. Medical and surgical patients should stay in one ward or room from admission to discharge

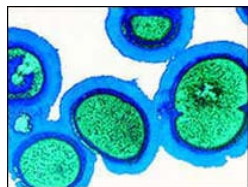
Inevitably, some patients will have to be moved for x-rays, some other investigations and operations. Strict infection control measures must be enforced to minimise staphylococcal transmission.

Recommendation 6. Any new patient management system must be constrained by the necessity for it to be entirely compatible with the basic principles of good infection control.

Restricting staff movements

The current patient management systems result in the frequent movement of medical and nursing staff around hospital. This should be minimised. One of my colleagues, a consultant physician, told me of a medical round he conducted on his patients. There were 18 patients and he had to visit 18 wards.

Recommendation 7. The patients of individual medical and surgical teams should be kept together on two wards, one male one female. In this context a ward is defined as a Nightingale ward or a collection of single rooms or rooms occupied by more than one patient.



Washing Dirty Linen

Blankets bedding and pillows are become heavily contaminated with skin squames and, when the bed occupants are a staphylococcal carriers, bed making throws clouds of potentially infective particles into the air. Blankets travel with patients on diagnostic excursions around hospitals and they can pick up or drop bacterial passengers on the way.

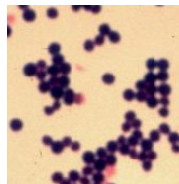
“In the 1970s, there was a requirement for laundries to be designed and operated on the ‘barrier principle’, i.e. the ‘soiled’ operations were to be totally separated from the ‘clean’ operations by a physical barrier and staff could not pass between the two without changing clothes, etc. This requirement disappeared in the climate of competitive tendering in the 1980s because it was considered to be ‘restrictive’ in market terms”.

*Tom Nelson, Linen Services Manager. Marks on Linen- the universal redistribution of filth
The Bulletin of The Royal College of Pathologists 129: Jan 2005*

It is questionable whether all laundry wash processes now meet the minimum recommended standards for thermal disinfection.

Recommendation 8. Hospital laundries should operate to the standards set down in the 1970s. Contracts for the provision of hospital laundry services should make that clear.

Recommendation 9. Hospital staff should ensure that laundry is collected, bagged and made ready for collection in accordance with the 1970s guidelines.



Screening.

Screening for MRSA should be selective, but its precise place is controversial. In most hospitals contacts of known cases, including nurses, are screened so that secondary cases can be detected and treated.

It is reasonable to screen all patients transferred to referral units from other hospitals or from abroad as they are a particular hazard and extra precautions may be taken when MRSA carriers are detected. As screening is already standard practice no new recommendation is made here.

Training and Education.

It may be argued that training and education already take place, but as many of the lessons of the past have been ignored for the last thirty years, more training in the application the principles of infection control is called for. Without it, it may be impossible to change habits of a staff, lulled into a false sense of security by years of effective antibiotic therapy. It will be vital for senior staff to lead by example.

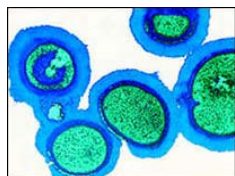
Recommendation 10. Continuing education and training in the basic principles of infection control and their application should be increased.

Hand Washing and Cleaning.

Hand washing and cleaning are important elements infection control, but they are not enough by themselves to prevent the spread of MRSA.

Recommendation 11. Campaigns to improve hand washing and hospital cleaning may help reduce MRSA infection rates when used *in combination with other measures* advocated here. They should continue.

Recommendation 12. Some disinfectants are much more effective than others at removing and killing MRSA. The best cleaning methods and disinfectants should be used.



Government Policy.

The implementation of the recommendations already described would be unpopular. Government would find it expensive, managers would feel that it would limit their flexibility, doctors would have to change their ways of working. But the Government will have to decide the lengths to which it is prepared to go to control MRSA. It will certainly prioritise any changes and it would be sensible to direct attention and support at first to hospitals with most MRSA infections, but there could be no compromise with the principles of

infection control. Nor would it be possible to direct the changes to take place without providing the essential resources. Nursing patients in single rooms requires more nurses and changing the systems of patient management will reduce bed occupancy and increase waiting lists. The benefits will have to be weighed against the disadvantages and decisions made. These should be clear and open.

Recommendation 13. The Government should make a clear statement of its priorities in respect of infection control and bed occupancy.

Antibiotic Development.

Effective infection control measures will slow the spread of MRSA and minimise the number of infections, but new antibiotics are urgently needed to treat infected patients and that need will increase. In the long term staphylococci with epidemic propensities resistant to all the currently effective agents are likely to appear.

“The Staphylococcus is a very clever organism. No antibiotic will be found to which it does not eventually become resistant.”

Sir Alexander Fleming

The first paper describing methicillin and its properties was published in 1960. It was in general use by 1961. What took a year in 1961 would take ten years now because of new regulatory requirements. Since the discovery of methicillin many antibacterial substances have been discovered, but not developed because development is not justified by the potential returns on investment. The developed world needs new effective antibiotics and Governments will have to decide whether they are prepared to relax the rules and regulations to get them.

Recommendation 14. The Government should enter into urgent discussions with the pharmaceutical industry with the aim of promoting the development and early introduction of new effective antibiotics.

This list of recommendations is not intended to be exclusive.

A Last Word.

I am under no illusions. A few people will say that some of these recommendations are unnecessary and that implementing them is not practical. It does not matter. I do not expect many of them to be implemented now. But if I am right and they are not things will get worse. The proof of the pudding will be in the eating.

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