

## Sup 11

### Nosocomial & pandemic control.

#### Summary

This paper explores the known and expected deficiencies in protection and care; both in the private sector and within the National Health Service following the exposure to infectious pathogens such as have been seen in SARS *severe acute respiratory syndrome* and the potential ramifications of H5N1 bird flu pandemic.

The world's health care providers have limited experience in the response and treatment of SARS or bird flu, and we must therefore extrapolate this experience to assess future risk. The CDC *centre of disease control* published papers are used as reference points and listed.

#### Overview

The SARS outbreak in 2003 affected the following hospitals which resulted in important response and affect data being recorded. It can be seen from the table 1 that nosocomial or hospital acquired infection affected a disproportionate number of professional HCW *health care workers* who were or should have been protected.

Table 1

Hospital name	Total infected	HCW
Prince of Wales Hong Kong	331	160
Mount Sinai Toronto	36	47
Taiwan	137	45

It can be seen that despite PPE *personal protective equipment* and training that HCW were not protected adequately.

Apart from legal obligations regarding the safety of employees the hospital administration were faced with depleted resources and increasing work load which resulted in:

- Psychological stress within the available workforce
- Denial of risk by HCW
- Rebellious behaviour

Patient care deteriorated as lack of carers resulted in patient isolation, with reported complaints from patients with mild symptoms of boredom and insomnia. Patient isolation was increased because relatives were afraid or prevented from visiting.

HCW were dissuaded from mixing socially and staff meetings were discouraged and the perception of personal danger was exasperated by uncertainty.

Although HCW were not required to wear PPE at home they were adversely affected as they believed they and their families were at risk from contagion. Uncertainty & stigma were prominent themes in both staff & patients. The loss of home care and or support due to fear are obvious additional and possibly unnecessary strains on the health service.

So great was the psychological stress and fear that some hospitals recruited external psychiatrists as HCW felt unable to talk about personal concerns with working colleagues.

#### Vector agents

The routes for infection were recorded as person to person, contact through droplets and body fluids. Inanimate objects, such as door handles, water fountain buttons were also found to be vector agents and viral stability may be expected to last 1-2 days. Aerosol generating procedures i.e. intubation, nebulising medications were also high risk procedures. It has also been suggested that limited airborne transmission may be possible. Negative air pressure rooms were utilised as SARS control factors in Taiwan but were quickly overwhelmed. Basically all infectious treatments must be seen as resource intensive and therefore these resources must be protected.

#### **Standard Operating Procedures SOPs**

The continual use of full PPE is not generally recommended unless a specific threat has been assessed. Clearly a pandemic or epidemic could result in this need and the use of eye, face, respiratory and body protection. This assumes that all HCW are trained and equipped with suitable PPE.

The usual personal protection recommended for airborne or droplet pathogen is a fit tested N95 respirator and eye protection with hand and body protection too. This level of protection could be called for in a variety of circumstances including MDRTB, smallpox, viral hemorrhagic fever and H5N1 bird flu.

The legislative requirements of fit testing, maintenance, servicing, records and training for all HCW would be a considerable drain on financial resources and this would be exasperated by the need for substitute equipment and or decontamination procedures required in between shifts or breaks.

From the CDC papers and data it can be seen that current PPE and indeed training is not matched to the potential hazard and threat of a serious pandemic.

Control groups were studied which were both protected with PPE and unprotected and no significant difference was recorded regarding infection. The papers reflect that HCW were dissatisfied with PPE and respirators in particular. Complaints about breakthrough, misting, and fit were general and the frequency of touching the mask to re adjust were typical complaints.

A conclusion was that PPE was one of the most significant shortfalls in HCW duties and this was exasperated by the fact that it was in short supply.

The HCW respirator of choice the N95 has a significant shortfall in its role as defence against viral or airborne contamination, especially at close quarters. It is recognised that it will provide 95% protection when fit tested and not under strain, but when a HCW is working, talking and generally moving facial muscles and jaw bone the leakage is likely to increase. Where viral or bacterial pathogens are encountered which is growth exponential, greater protection must be provided.

The Bio hood which seals around the neck and has nano filtration which exceeds HEPA standards should be considered.

End.