

# **Experience sharing on Influenza incident in a ward setting and the control measures**

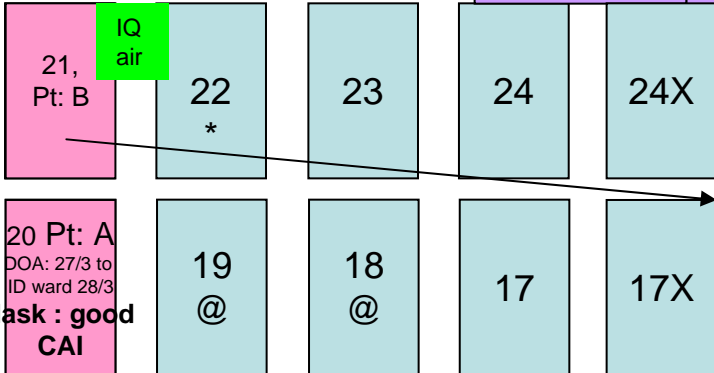
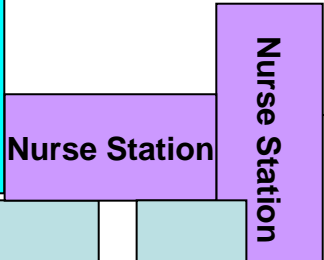
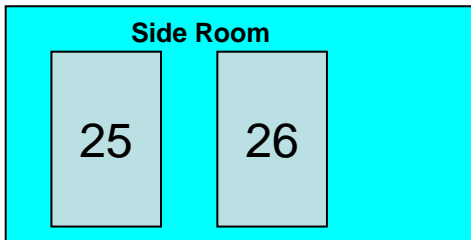
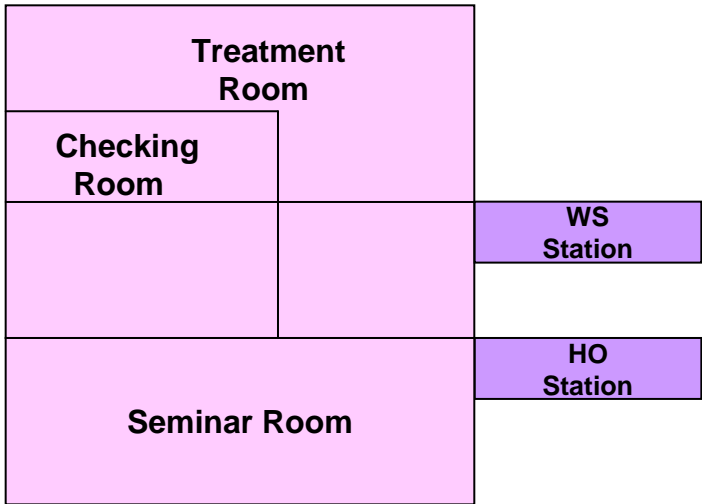
Gloria Chiu  
ICN, PWH

# Background

- Occurred in a general medical ward with open bay setting
- 3 April 2008 , 2 patients found to have Influenza A (1 CAI, 1 HAI)
- 2 staff also reported to have ILI on 1 April (both recovered )

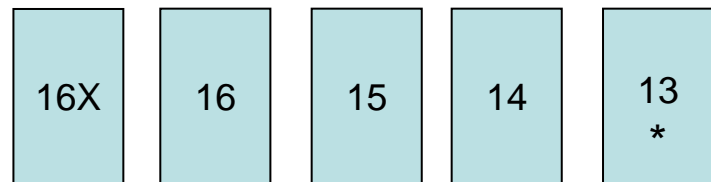
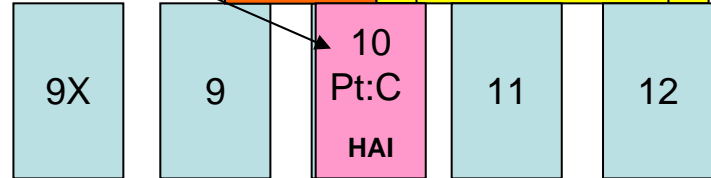
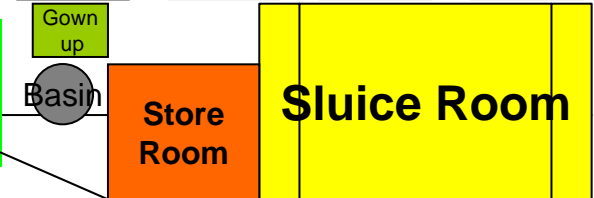
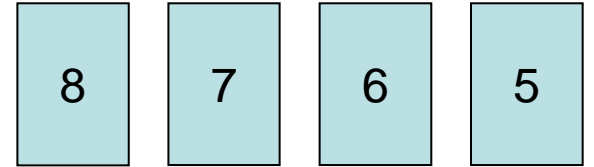
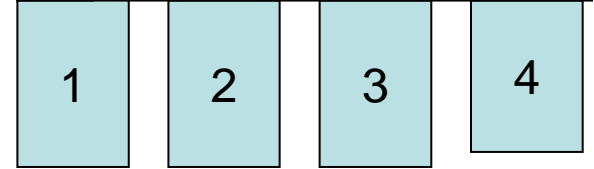
# FLOOR PLAN

at 3/4/2008



Pt: B DOA: 27/3, on 1-2LO2  
T/I fr other hospital C but no F, CXR:  
↑ shadow started BIPAP on ¼ with IQ air

Pt: C, stayed in 9D since Feb 08, onset: F+C +Spt on 2/4



LOW

LOW

\* NPA already taken  
@ suggested to take NPA

**Patient Toilet**

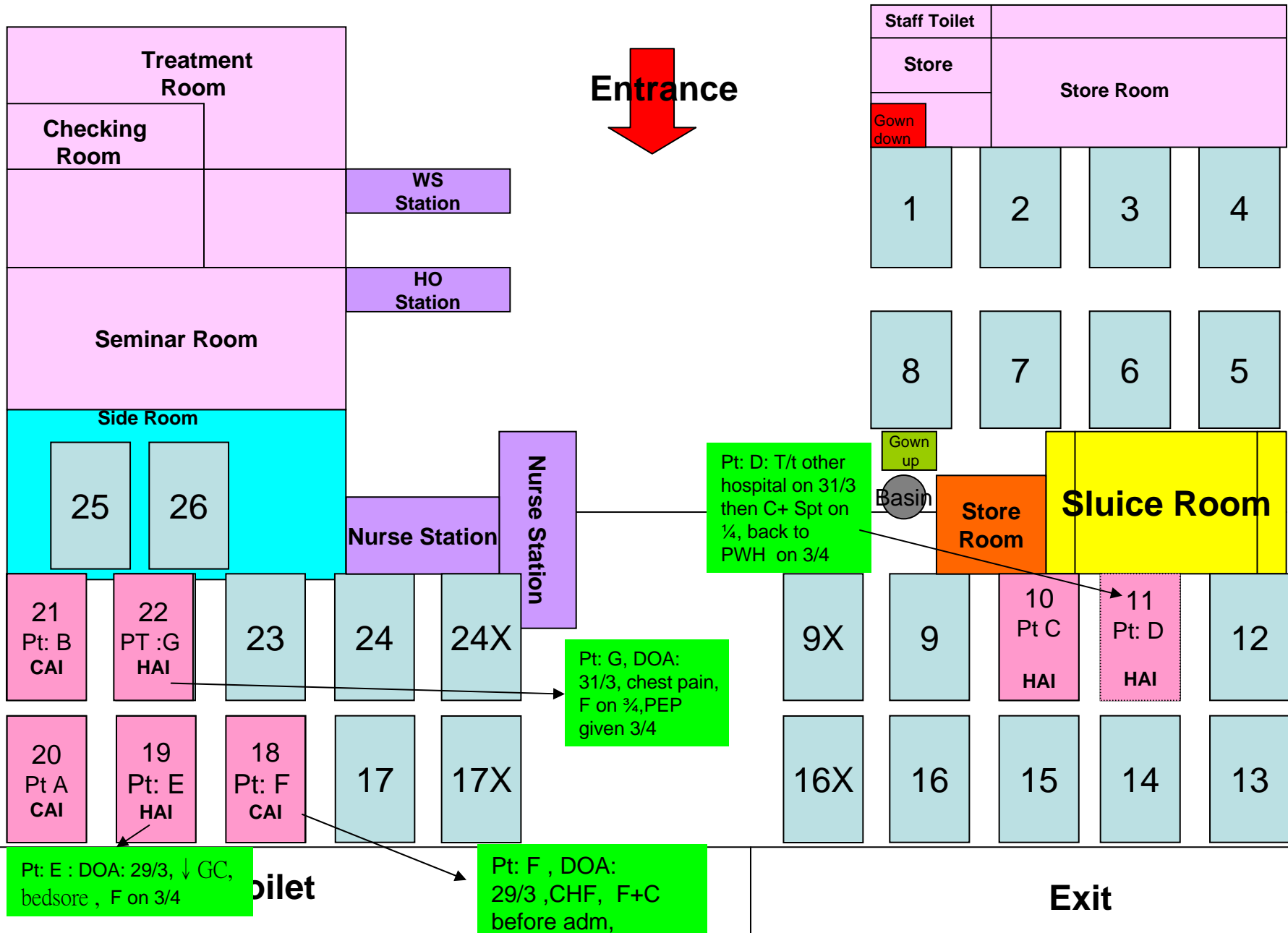
**Exit**

# IC measures on 3/4/2008

- Isolated Positive cases to ID ward
- Screened all fever cases , +/- NPA
- PEP offered to adjacent bed contact (bed 22)
- Carried out Contact tracing : staff and patients
- Implemented Droplet precautions to 2 affected cubicles
- Cleansing
- Advised visitors to wear Surgical mask

# FLOOR PLAN

At 4/4/2008

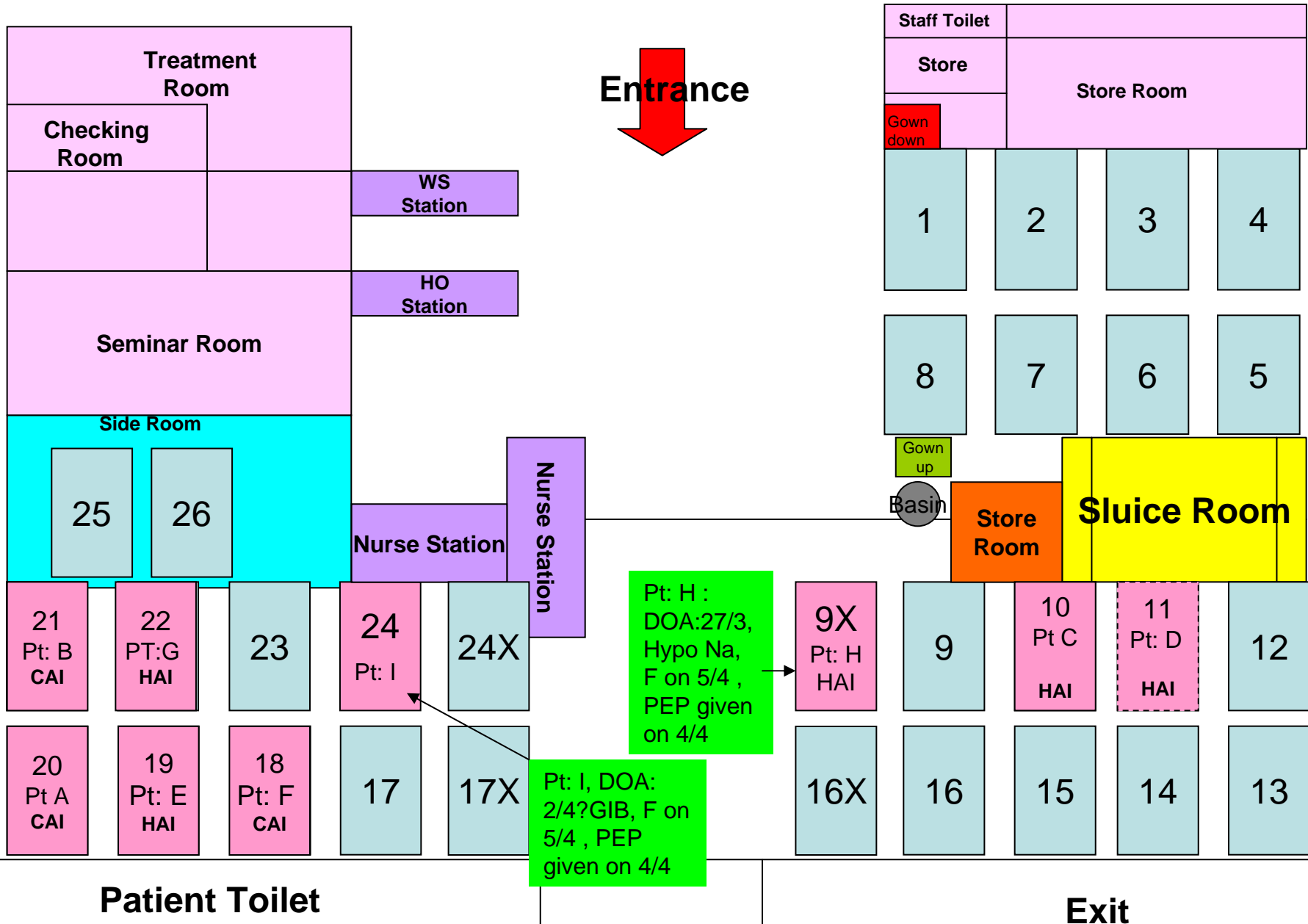


# IC measures on 4/4/2008

- Closed ward - no admission or transfer out to other ward / hospital or discharge to OAH
- No visiting and access control outside ward entrance
- Implemented Droplet precautions to all patients
- Offered PEP to all staff and patients

# FLOOR PLAN

At 5/4/2008



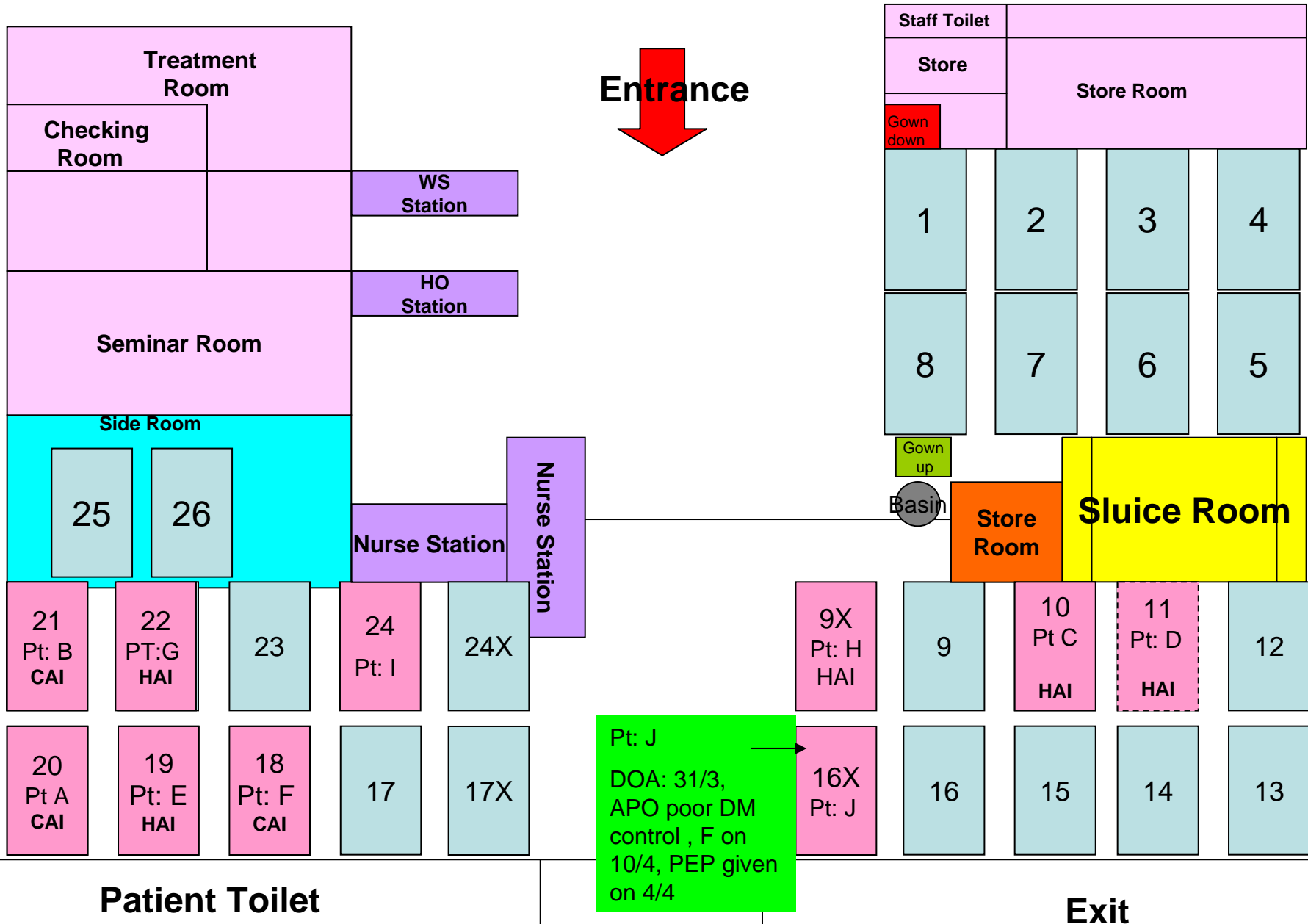
# IC measures on 5/4/2008

- 1st HOCT was held
- Extended the Contact tracing to all mobile staff, medical students and offered PEP
- Contacted E&M for air flow direction and measurement



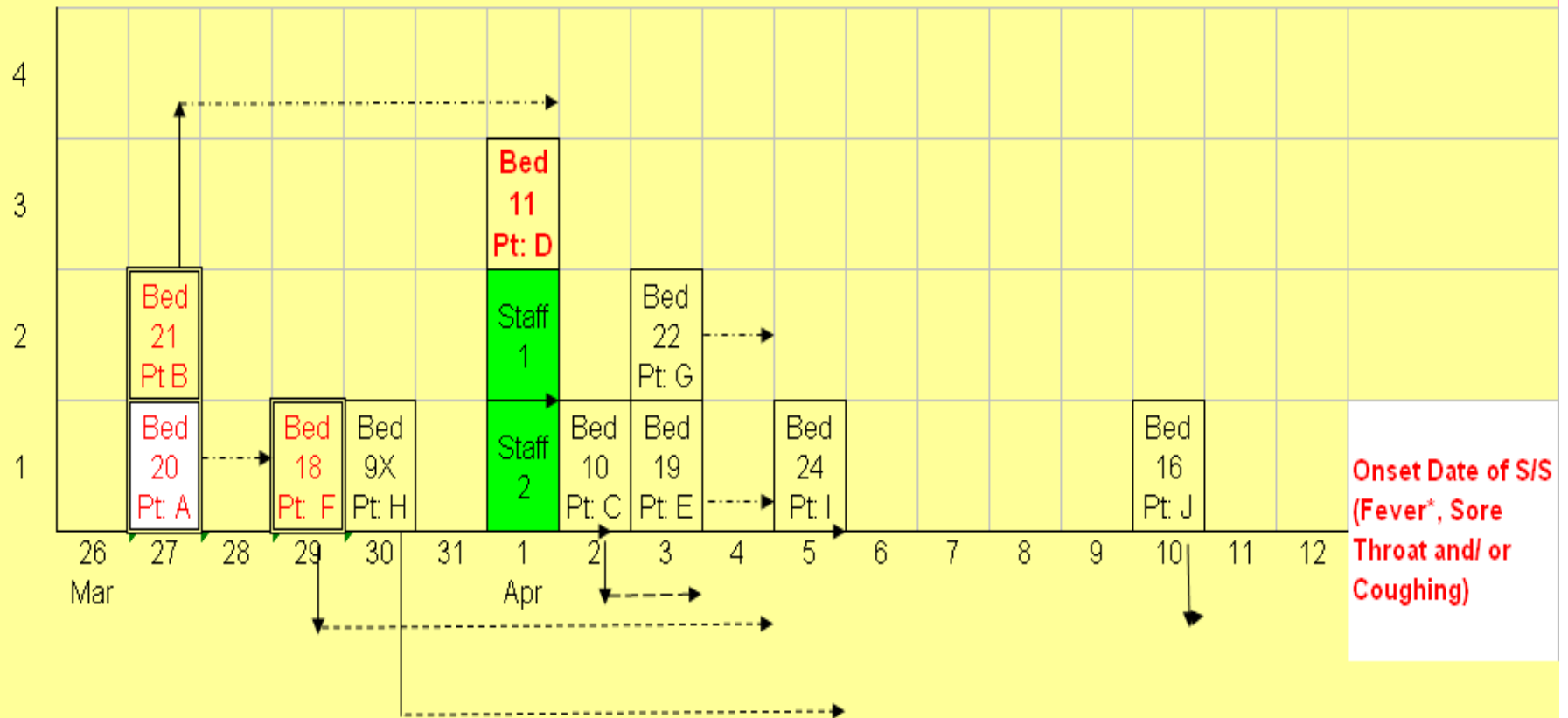
# FLOOR PLAN

At 10/4/2008



# Epicurve

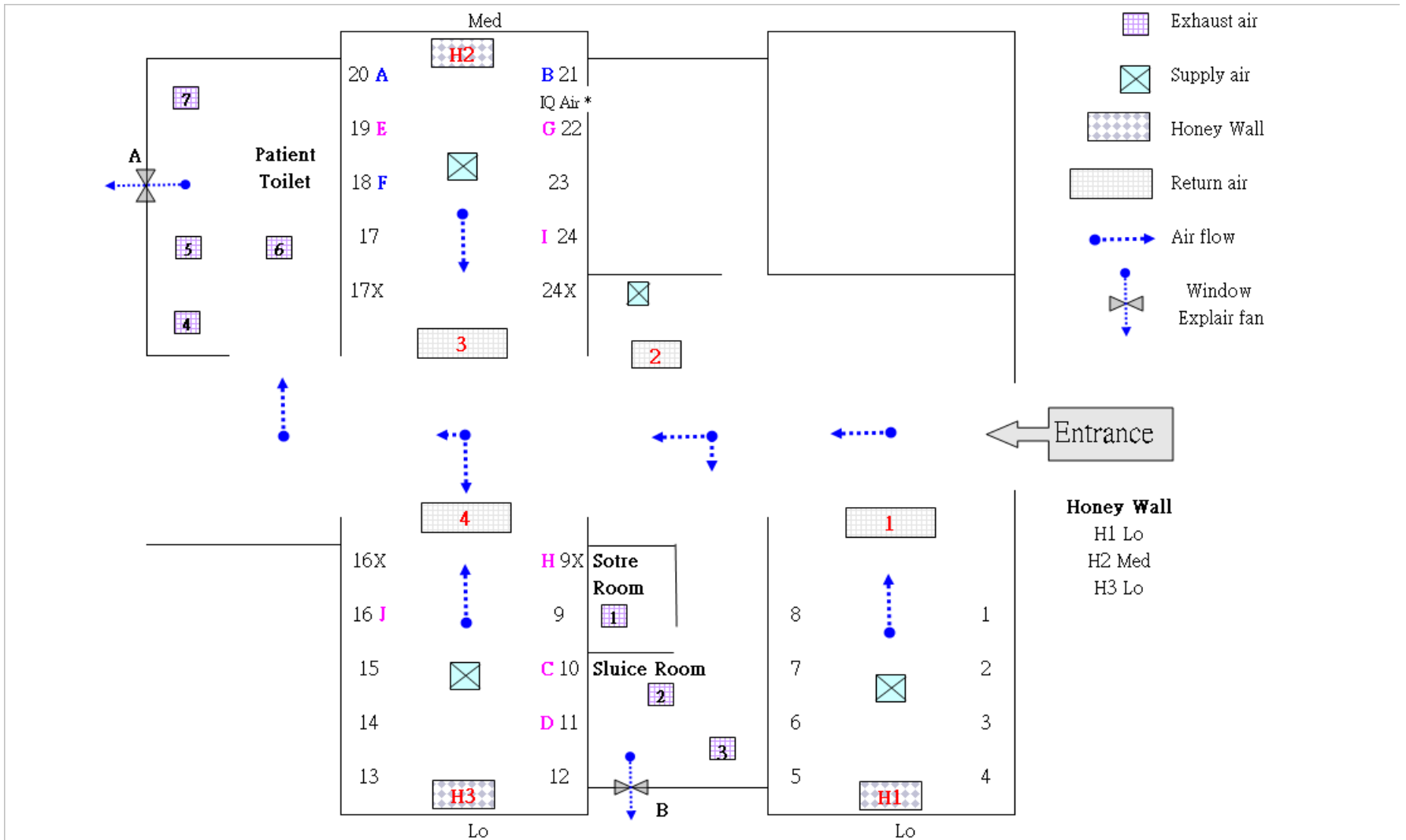
No. of Case



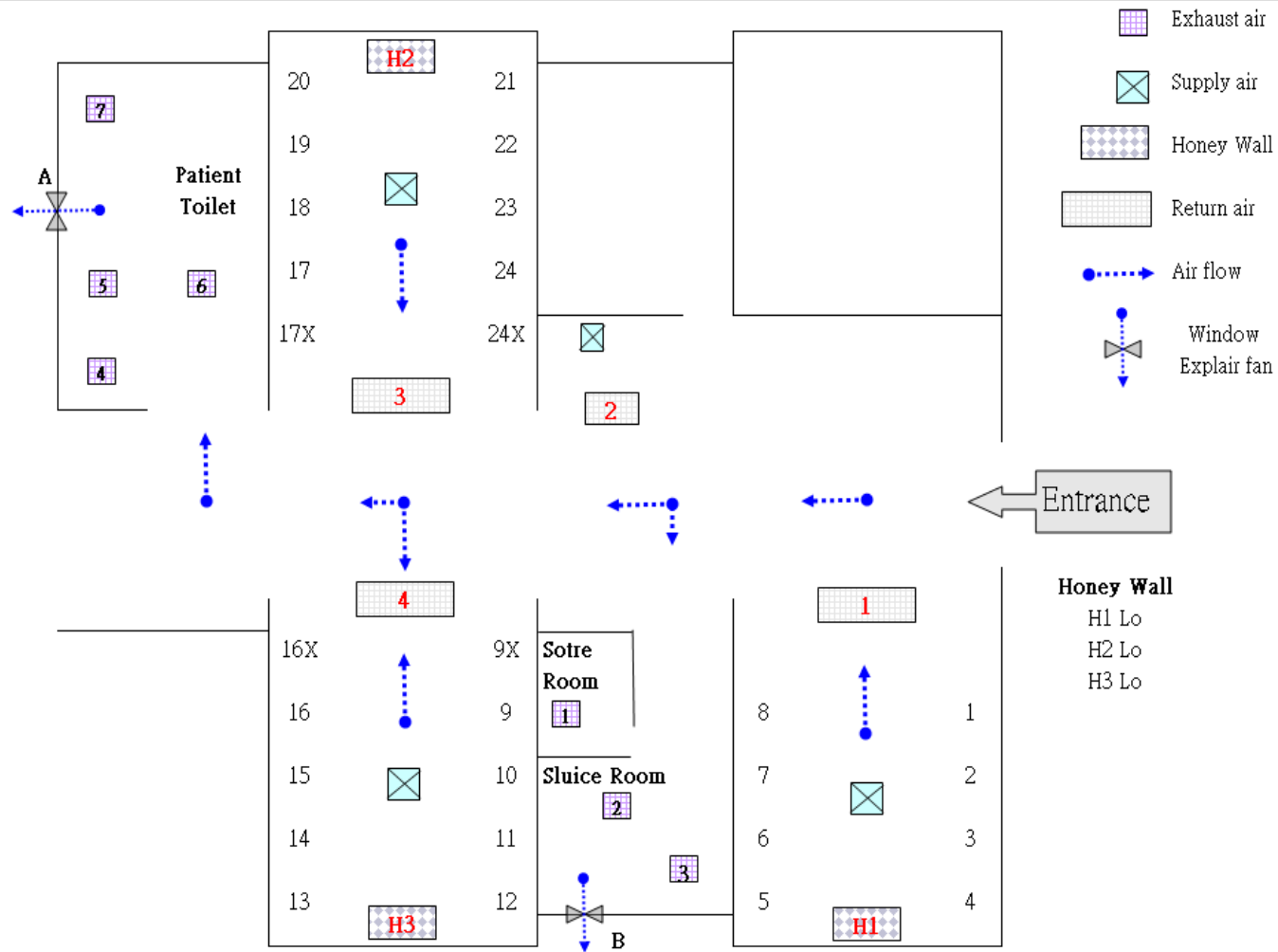
# Conclusion

- Total 10 patients involved (7 HAI + 3 CAI) (H3N2)
- Total 2 staff with ILI but not Influenza A

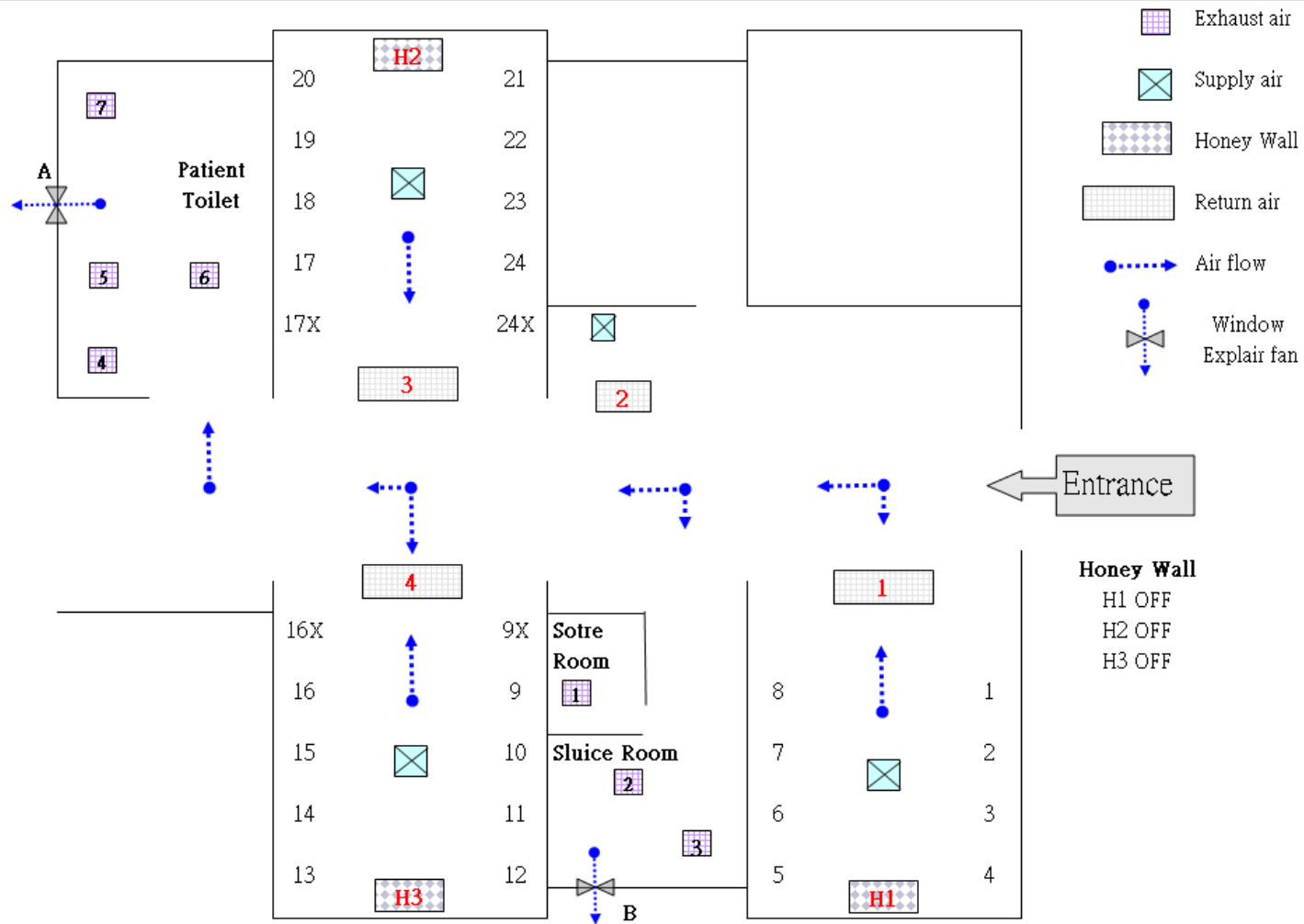
# Air flow direction test 1



# Air flow direction test 2



# Air flow direction test 3



# Air Purifier

Clean air



Dirty air

Honeywell

# Background of installation of Air Purifier (Honeywell)

## 1. Introduction

According to CDC's Morbidity and Mortality Weekly Report (MMWR), portable HEPA filtration units may be considered for re-circulating air within rooms where the ventilation system is incapable of providing adequate airflow, or where increased effectiveness in room airflow is desired.

CDC's MMWR also recommends that portable HEPA filtration units should be designed to achieve an air change of at least **12ACH**. Besides, the units should also be designed to ensure adequate air mixing in all areas of the hospital rooms in which they are used, and they should not interfere with the current ventilation system.

Against the above background, a number of floorstanding air purifiers (with built-in HEPA filters) have been installed in some selected clinical areas in Prince of Wales Hospital with a view to further improving the air qualities of the areas by means of re-circulating and filtering indoor air and thus removing any contaminants in the air at a high frequency and filtering efficiency.



# Performance of the Air Purifier (Honeywell)

## Performance of Air Purifiers

### 4.1 Airflow and Air Change Rates

For a typical cubicle of a volume of some 130 m<sup>3</sup>, the following table gives the indoor air re-circulating/purification rates and equivalent air change rates at various purifier operating speeds:

Purifier Operating Speed	Air Re-circulating Rate (m <sup>3</sup> /hr)	Air Change Rate (ACH)
Low	1600	12.3
Medium	2100	16.1
High	2400	18.4

# Recommendation of using the air Purifier ( Prof of HKU)

- In theory, the Honeywell ventilators with HEPA filters should help in
- improving the air quality (removing particulates, including possible
- bioaerosols), **the problem was the fan settings**. The one in the index
- patient cubicle (H2) was set to Med, but the other two (H1 and H3)
- were set to Low, **resulting in a relative positive pressure in the**
- **index cubicle**. This was coupled by an imbalance of the air supply
- through the supply diffusers in the 3 cubicles, with an unusually low
- net supply to the opposite cubicle, **resulting in air moving from the**
- **index cubicle to the opposite cubicle**. The distant cubicle was
- protected by a larger net air supply from the ward ventilation system.
- I think there are no strong reasons to stop all Honeywell ventilators
- at this moment (Yuguo Li from HKU and I may do some more assessments
- later), **the important thing is to fix the fan settings of the**
- **different machines to the same level, and do not allow anyone in the**
- **ward to alter them. We should also ask the E&M people to balance the**
- **air supply and exhaust in the different cubicles, then fix the**
- **settings and forbid people in the ward to change the settings.**

# BIPAP usage policy in M&T

- Alert A&E to admit potential BIPAP patients (for whatever indications) to ID ward whenever possible
- Initiate BIPAP only in ID ward or if urgent side room of general ward as alternative
- Appropriate infection work up (including NPA) prior BIPAP or ASAP after starting BIPAP to ascertain infection status
- Consider step down to general ward for cases requiring prolonged BIPAP and confirmed negative infection status

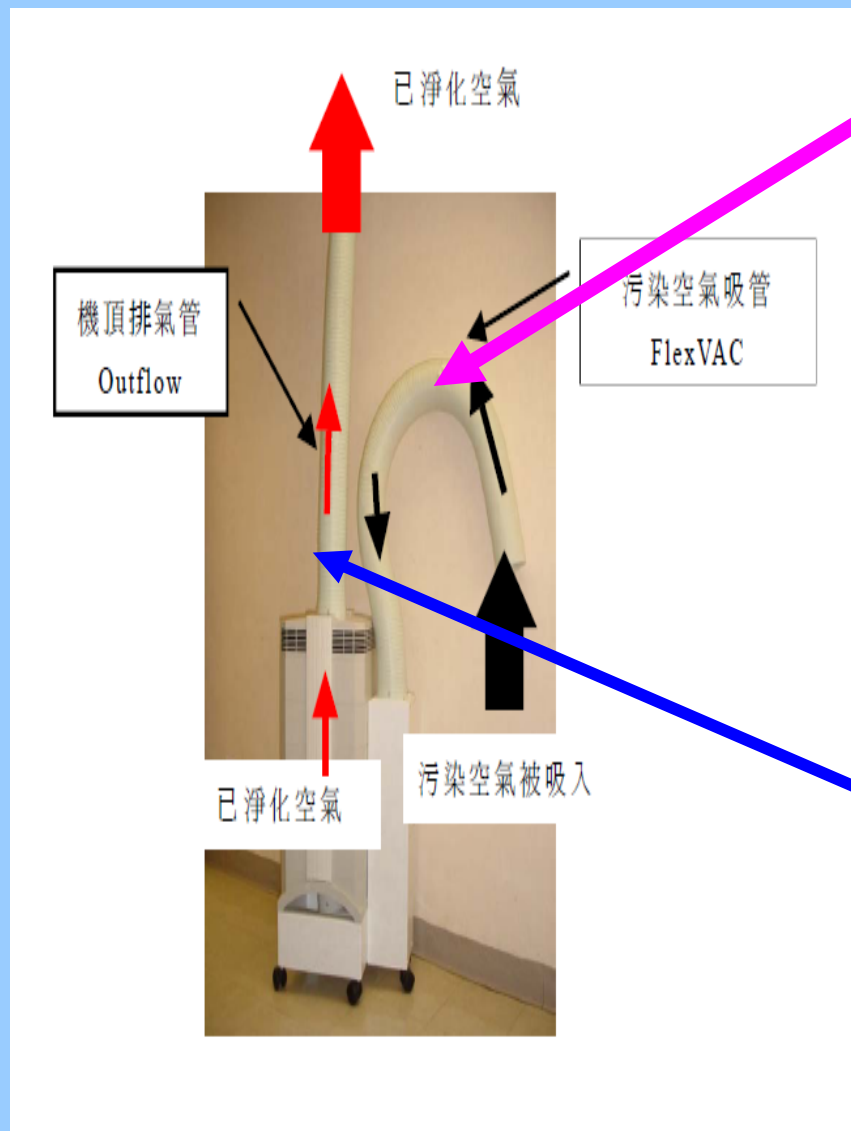
## APPENDIX I

### Note 4: Precautions for Patients with Droplet Precautions and Aerosol Generating Procedure

(with **NEGATIVE TOCC** and **AI/ SARS** not suspected)

Aerosol Generating Conditions	Infection Control Measures	
<u>One off procedure</u> e.g. Nasopharyngeal Aspiration	Negative pressure single room * with full PPE including N95 respirators, gloves, gowns and face shield.	
<u>Continuous</u> e.g. NPPV  <u>Intermittent</u> e.g. Regular sputum suction	Negative pressure isolation room*  Full PPE including N95 respirators, gloves, gowns and face shield.	<ol style="list-style-type: none"> <li>1. If Immunofluorescence (IF) test of nasopharyngeal is positive, the above measures should be continued.</li> <li>2. If the Immunofluorescence (IF) test is negative and the patient's condition is still suspected of viral infection in origin, the above measures should be continued until respiratory symptoms subsides</li> <li>3. If the Immunofluorescence (IF) test is negative and the patient's condition is not suspected of viral infection in origin, the infection control measures can be discontinued</li> </ol>
Remarks * : If negative pressure isolation room is not available, then consider side room with portable HEPA filter after consultation with EMSD to verify that no stagnation of air/ short circuit is created by it.		

# Use of IQ air



## 四：使用吸氣管的注意事項：

### 1. 距離

—吸管應與污染源保持一呎至三呎的距離如下圖示範，達至最理想的效果。



The Outflow duct should not be placed near the air supply

# Lesson learnt

- **Case finding: screening of patient with fever +/- ILI (both new and old case)**
- **Implementation of IC measures**
- **BiPAP usage**
- **Fix all the FCU and Air Purifier setting**
- **Hand Hygiene**

Thank you