A Case Example of PPE Selection and Use in the Hospital Environment
Medical surveillance for tuberculosis monitors for healthcare associated transmission.
TB Surveillance

- TB skin tests are performed
  - At hire as baseline for all (2 step)
  - Annually in patient care, and
  - Periodically following exposure and in high risk groups

- Respirators (N-95) are issued to those who will enter airborne isolation rooms
Vanderbilt
TB Skin Test Conversions

- All tested at hire
- 19,514 were tested in FY 11 for some reason
- 32 work-related conversions documented
Study of TB Skin Test Conversion Risk

- **Research Question:**
  
  Do the groupings decrease the likelihood of conversion?
Groups with conversions:

- No direct patient care (Baseline)
- Working with patients (Annual)
- Entering airborne isolation (Respirator Group)
- Exposed to TB without respirator (Exposure Group)
Results from Model

- Baseline conversions for the model were 0.002%.
- The largest increase in risk for conversion was in the Annual Group.
- The next largest increase in risk was in the Exposure Group.
- Combined Annual and Exposure Risk: 1/100 (1.18%).
Results from Model

- HCP in the Respirator Group have nominal protection, but the effect is highly variable.

- For some in the Respirator Group, there was an increased risk of conversion, but for most there was a decreased risk.

- The respirator was significant for inclusion in the model as a factor with influence on conversion results.
HCP are more likely to convert if they are in the Annual TB Group with some additional risk if they are in an Exposure Group.

HCP in the Respirator Group do not have additional risk and they may experience a protective effect from respirator.
As part of routine surveillance for tuberculosis, there is a quarterly review of positive, work-related TB skin test conversions.

This report sorts positions with a positive TB skin test by department and job title.

If clusters are noted in shared departments or job titles, an investigation is carried out.
Example of a TB Cluster Tracker Report

All Work-Related Conversions With Service Date Greater Than 4/1/2011 & Prior To 6/30/2011

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Example of an Investigation: Case 1

- Occupational Health noted an increase in HCP conversions in the Emergency Department through the annual TB screening program.

- A hazard analysis noted that the number of TB patients treated in the Emergency Department had increased.
Case 1: Investigation

- Investigation of the work environment at the Emergency Department noted:
  - HCP were failing to close the doors on isolation rooms.
  - Some HCP were not compliant with wearing the respirator.
Case 1: Analysis

- A coordinated effort between Occupational Health, Infection Control and Environmental Safety produced a plan to address these issues, including:
  - Training in safe work practices, such as closing doors
  - Training in use of the respirator, and ensuring adequate supplies are available
  - Review of safety plans with Emergency Department management
  - Increased surveillance of TB skin testing to a bi-annual schedule
Case 1: Results

- No HCP developed secondary disease from this exposure event.
- In the following year there were zero conversions.
A cluster of positive TB conversions was noted for the Environmental Services Department.

What was going on?
Case 2: Investigation

- Based on knowledge of TB epidemiology, an exposure window was determined.
- All known TB cases in patients were reviewed, to look for overlap with environmental services personnel.
- Additional TB skin testing of environmental services personnel revealed no additional conversions.
- All personnel completed a staff survey to screen for symptoms, no cases related to TB.
Review of records in the VOHIS revealed lapses in respirator fit testing for these personnel.

Environmental Services was reported to be undergoing a change in management.

The new manager was contacted and a schedule was made to bring all environmental services personnel up-to-date on respirator fit testing and training.
Case 2: Results

- None of the exposed workers developed secondary disease.

- Occupational Health worked with EHS management to ensure adequate time for safety practices, such as fit-testing.

- The fit-test rate achieved goal target in the next quarter.
Respirator use is a key component of prevention from healthcare-associated TB, so TB skin test outcomes are a primary mechanism of measuring efficacy.
Questions?