Personal Respiratory Protection Programme for Airborne IPC

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Personal respiratory protection to prevent airborne transmission of TB and COVID-19
**Recommendation 7:** Particulate respirators, within the framework of a respiratory protection programme, are recommended to reduce *M. tuberculosis* transmission to health workers, persons attending health care facilities or other persons in settings with a high risk of transmission.
Effective Programme Components

Personal respiratory protection to prevent airborne transmission of TB and COVID-19
Who are HIGH risk Airborne Infections transmitters?

- Undetected, undiagnosed patients with (or without) respiratory symptoms
- RT-PCR-confirmed cases of COVID-19
- TB patients which do not receive EFFECTIVE treatment
  - Treatment delay, interruption, default
  - Ineffective treatment regimen
  - TB patients on palliative care
- Fluoroquinolone resistant patients during the first 2(?) weeks after EFFECTIVE treatment initiation

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Airborne Transmission Risk Assessment

Factors to consider:
• Patients and visitors with fever, cough and other respiratory symptoms
• TB patients
  • Sputum smear AFB positive, rapid molecular testing confirmed, DST (risk of DR TB)
  • Is treatment regimen adequate?
  • Is patient compliant?
  • Cough etiquette, mask use
• Work practices and aerosol generating procedures
• Environment
  • Crowding
  • Air stagnation
• Engineering controls: installation, maintenance, certification, use
• Subject’s immune status

Personal respiratory protection to prevent airborne transmission of TB and COVID-19
“Safety first!
Do not enter without respirator!”

Put warning signage at entrance to high risk areas

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Respirator use and fit testing policy

• Authorized responsible staff
• Annual training and fit testing for all HCWs
• Respirators distribution according to risk level (models, sizes, amount and protection class)
• Proper respirator use is mandatory in designated high risk areas and during such procedures
• Supervision, education and motivation

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• Must be performed before a respirator is first issued to a HCW and is recommended annually thereafter.
• Additional fit test is required whenever there are changes in the users face physical condition.
• NOTE: a separate USER SEAL CHECK must be performed each time the respirator is worn.

Qualitative Fit Test

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Respirator Qualitative Fit Testing kit

- Nebulizer
- Test hood
- Collar
- Sensitivity solution (sweet & bitter)
- Fit test solution (sweet & bitter)

Costs USD 200 – 250, lasts forever

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Preparation of Bitrex Solutions

• The Sensitivity Test Solution is prepared by adding 13.5 milligrams of Bitrex to 100 ml of 5% salt (NaCl) solution in distilled water.

• The Fit Test Solution is prepared by adding 337.5 mg of Bitrex to 200 ml of a 5% salt (NaCl) solution in warm water.

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10 minutes per test

Respirator Fit Testing

ETTi educational materials available

http://www.stoptb.org/wg/ett/resources.asp
• Initial instruction and fit-testing for new staff
• Annual Infection Control training related HCWs
• Annual qualitative test for all staff
• Posters and signage

Staff Education

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3M-6000 (FFP3) respirator use for the highest risk procedures

- Cough/sputum induction procedures
- Bronchoscopy
- Endotracheal in- and ex-tubation in ER & OR
- Autopsy

Lasts longer, lower long term cost than for disposal respirators

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Disposable respirators needs assessment based on risk level and work load.

For **TB facilities** our estimates are:

- High risk area – 1 respirator per 2 working days
- Medium risk area – 1 respirator per 4-5 working days
- Low risk area – 1 respirator per 10-20 working days

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Respirators procurement

1. Models and sizes selection based on staff fit testing
2. Certified respirators
   • European Standard: EN149:2001+A1:2009 Respiratory protective devices - Filtering half masks to protect against particles - Requirements, testing, marking
   • US NIOSH Standard: 42 C.F.R. PART 84 — Approval of Respiratory Protective Devises

Avoid counterfeit goods!

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Counterfeit/poor quality respirators

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Personal respiratory protection to prevent airborne transmission of TB and COVID-19
• Select a fit tested respirator
• Place over nose, mouth and chin
• Fit flexible nose piece over nose bridge
• Secure on head with elastic
• Adjust to fit
• Perform a USER SEAL CHECK –
  ➢ Inhale – respirator should collapse
  ➢ Exhale – check for leakage around face
Re-use of disposable respirators

Definition

Definition: *Single-use respirator* means a respirator that is entirely discarded after excessive resistance, sorbent exhaustion, or physical damage renders it unsuitable for further use.

US NIOSH Standard: 42 C.F.R. PART 84—APPROVAL OF RESPIRATORY PROTECTIVE DEVICES

Mind contact SARS-CoV-2 transmission from contaminated respirator!

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HCW Compliance Issues

<table>
<thead>
<tr>
<th>Reason</th>
<th>Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skepticism</td>
<td>Educate</td>
</tr>
<tr>
<td>Negligence</td>
<td>Motivate</td>
</tr>
<tr>
<td>Discomfort</td>
<td>Train, offer other models/sizes</td>
</tr>
<tr>
<td>Communication difficulty</td>
<td>Educate, offer other model</td>
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</tbody>
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Compliance among staff is growing in time and initially is much higher among younger HCWs.

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Respirator Care

Personal respiratory protection to prevent airborne transmission of TB and COVID-19

Disposal respirators
• Never clean, wash, disinfect, repair
• Keep in dry cloth
• Dispose if:
  • Worn
  • Damaged
  • Contaminated
  • Does not provide seal
• Replace if it gets wet

Elastomeric face piece respirators
• Can be cleaned and disinfected (not filters!)
• Replace filters if
  • Damaged
  • Contaminated
  • Excessive resistance to breathing
Respirator disposal

- Re-aerosolisation of infectious particles from respirator is extremely unlikely
- Contaminated respirators may pose risk of contact infections, including SARS-CoV-2, not TB
- Used respirator should be disposed with other potentially infected medical waste according to national regulations
Personal respiratory protection program cycle

Personal respiratory protection to prevent airborne transmission of TB and COVID-19
Conclusions

• Personal respiratory protection program can be feasible if based on adequate administrative and environmental controls

• Compliance among staff is growing in time and much higher among younger HCWs

• This program contains important educational component for HCW, patients and visitors on Airborne Precautions (THINK RISK!)

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Thank You!

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