Evaluation of N95 Filtering Facepiece Respirator Program Elements

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Fraser Health Workplace Health
Agenda

1. N95s and Fit-Testing: Background
2. Common Fit-Testing Methods
3. Research Objectives and Methodology
4. Initial Outcomes
1. N95s and Fit-Testing: Background
What is a Fit-Test?

N95 filtering facepiece respirators (N95s) are commonly used in many departments across Fraser Health for protection against airborne infectious material e.g. Tuberculosis, pandemic influenza

Approximately 70,000 N95s are used in Fraser Health annually

The material of an N95 is highly effective at filtering out airborne particulate but the N95 must also form an effective seal the user’s face

A fit-test is a qualitative or a quantitative method to evaluate the fit of a specific make, model, and size of a respirator on an individual
1. N95s and Fit-Testing: Background

- **Why Fit-Test**

  WorkSafeBC Occupational Health & Safety Regulation Section 8.40

  - “A respirator which requires an effective seal with the face for proper functioning must not be issued to a worker unless a fit test demonstrates that the facepiece forms an effective seal with the wearer's face.

  - Fit tests must be performed in accordance with procedures in *CSA Standard CAN/CSA-Z94.4-02, Selection, Use, and Care of Respirators*.”

  CSA Z94.4-02 Clause 7.1.4

  - “*Under no circumstances* shall a person use a tight-fitting respirator until a satisfactory qualitative or quantitative fit test has been achieved.”

- Scientific literature
1. N95s and Fit-Testing: Background

- **Frequency of Fit-Testing**
  - WSBC OHSR Section 8.40(2.1)(b)
    - “A fit test must be carried out at least once a year”
  - CSA Z94.4-02 Clause 7.13(b)
    - “A fit test shall be carried out at least every 2 years; however, it is recommended that a fit test be conducted annually”
1. **N95s and Fit-Testing: Background**

- **User Seal Check (Fit Check)**
  - An action conducted by the respirator user to determine if the respirator is properly seated to the face
    - Positive and negative pressure fit-check
  - Scientific literature and our own extensive experience illustrates that a user seal check is **NOT** a substitute for a fit-test
1. N95s and Fit-Testing: Background

- **Impact of Current Regulatory Requirements**
  - Over 217,000 health care workers in BC
  - Over 10,000 staff required to be fit-tested annually in Fraser Health and Vancouver Coastal Health
    - 9200 hours dedicated to fit-testing / year
    - Approximately $370,000 / year
2. Common Fit-Testing Methods
2. Fit-Testing

• Two Fit-Test Methods

1. Qualitative

- A pass/fail method that relies on the subject’s sensory response to detect a challenge agent in order to assess the adequacy of fit
  - e.g. Bitrex™ qualitative method

2. Quantitative

- A test method that uses an instrument to assess the amount of leakage into the respirator in order to assess the adequacy of respirator fit.
  - e.g. PORTACOUNT® quantitative method
3. Research Objectives and Methodology
3. Research Project

- Background

- Research team:
  - Chun Yip Hon / Quinn Danyluk - Co-PIs
  - George Astrakianakis
  - Elizabeth Bryce
  - Bob Janssen
  - Annalee Yassi
  - Mike Neudorf
3. Research Project

- **Research Project**
  - Strengthening N95 Filtering Facepiece Respirator Protection Programs by Evaluating the Contribution of Each of the Program Elements
  - 3-year project funded by WorkSafeBC Research Secretariat
  - Began November 2007
3. Research Project

- **Objectives**

1. Determine if there is a significant difference between failure rates associated with annual versus biennial fit-test frequencies for N95 FFRs.

2. Evaluate the level of N95 FFR donning and doffing skills retained by staff fit-tested on an annual basis only, biennial basis only, or biennial basis but with an annual education component in between fit-tests.

3. Assess the fit-test failure rates (both alpha and beta) between the Bitrex™ qualitative method and the PORTACOUNT® quantitative method for N95 FFRs.

4. Determine the effect of regular usage on fit-test failure rates as well as on the level of donning and doffing skills retained by staff using N95 FFRs.

5. Evaluate the applicability of a user seal check as a surrogate for a fit-test in determining an adequate fit on an N95 FFR.
3. Research Project

- Research Design

<table>
<thead>
<tr>
<th>Group</th>
<th>Setting Selected From</th>
<th>Year 1 (\text{Education/Training} \text{ Fit-Test} )</th>
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4. Initial Outcomes
4. Initial Outcomes

- Assess the fit-test failure rates (both alpha and beta) between the Bitrex™ qualitative method and the PORTACOUNT® quantitative method for N95 FFRs.

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<th>Fail Bitrex</th>
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<tr>
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• Questions?

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