Proposed Standard Practice for PPE Contaminated Doffing

Interagency Board
Standards Coordination
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Need / Purposes

• Risk exists for transfer of contaminant from protective clothing to wearer or outside contamination reduction zone

• Recent Ebola outbreak in 2014 to 2015 includes several cases where health care worker infection was the result of contamination transfer was result of doffing

• Procedures needed are to assess protective clothing design and doffing procedures, particularly for multi-item ensembles

• Procedures can also be useful for training purposes for instructing end users for proper doffing and contamination avoidance

• High priority standard for Interagency Board
Prior Work


Test Principle and Methodology

• Test subject wears black witness garment; examined under UV light to establish baseline
• PPE ensemble put on according to manufacturer instructions
• Test subject subjected to spray of surrogate contaminant using fluorescent agent
• Test subject doffs PPE ensemble according to manufacturer instructions
• Test subject examined under UV light to determine contaminant transfer to body
Primary Method Attributes

• Selection of surrogate contaminant
  – Chemical liquid
  – Biological fluid

• Method of contaminant application
  – Aerosol versus spray

• Doffing approach
  – Assisted versus unassisted

• Methods for documenting results
  – Examination and photography
  – Quantification techniques
Military Work

• Battelle undertook work to examine contaminated doffing of CB Ensembles and identified needed changes in doffing procedures

• A Test Operating Procedure was put together to provide guidelines for this testing

TECMIPT Test Operations Procedures (TTOP) Test for Cross Contamination During Doffing of Personal Protective Equipment
Current Work

• Several possible surrogate contaminants identified

• Procedures under development for:
  – Applying contaminant
  – Doffing techniques
  – Visualization of residual contamination
  – Potential quantification of contamination levels
  – Methods for reporting results
Preliminary Findings for Practice

- Selection of witness garment important for ensuring visualization of contaminant
- Additional patches placed on exterior during contamination process help to ensure consistent application of contaminant
- Aerosolized contaminant creates significant exposure of wearer
- Extreme care must be given to doffing procedures
- Videotaping of doffing helps to identify doffing missteps
- Design for efficient doffing may negate certain features created for improved protection
 Identified Practice Limitations

• Surrogates may not be subject to ordinary decontamination methods (e.g., bleach disinfection of biological fluids)
• Assisted doffing required additional controls for tracing contaminant transfer
• Difficult to detect low levels of contaminant penetration without quantification techniques
• Photography proves difficult for capturing images of contamination
• Determination of usable test results requires careful interpretation of findings
Proposed Approach and Accomplishments

• Task group formed under ASTM Committee F23
• Proposed standard practice registered as work item (WK55144), “New Standard Evaluating the Transfer of Exterior Contaminants from Protective Clothing During Doffing”
• Key elements of standards development
  – Permit different surrogate contaminants to represent range of applications
  – Allow options in practice to apply contaminant / undertake doffing procedures
  – Establish safety procedures
  – Create procedures for visualization of contaminant
  – Have adjunct procedures for quantification, if warranted
  – Standardize reporting and documentation
Final Notes and Requirements

• Bulk of work has been done in support of military or government programs by Battelle for both Joint Program Manager for Protection and U.S. Agency for International Development
  – Outside participation needed

• Positioning of standard practice within specifications desirable to aid in design process

• Practice also has utility as training tool but has to accommodate local jurisdiction needs
For More Information

• Contact Information

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