Projectile Fluid Resistance and Flammability of Respirators and Other Head/Facial Personal Protective Equipment (CAN# 93905MH)

Objectives

- Test the hypothesis that resistance to penetration of projectile synthetic biological fluids is dependent upon projectile direction, velocity, fluid volume, surface tension/viscosity and rigidity of the PPE.
- Test the hypothesis that respirators and head/facial PPE used in healthcare settings provide resistance to penetration of projectile synthetic biological fluids under the worst conditions identified above.
- Test the hypothesis that respirators and head/facial PPE provide expected flammability levels at controlled test conditions.

Project Scope (all years)

- Measure resistance to synthetic blood penetration of respirators and other PPE using the ASTM F1862 method and evaluate the effect of fluid direction, velocity, volume, viscosity and rigidity of PPE
- Measure the flammability levels of PPE

FY17 Milestones

- Q1. The protocol was reviewed by external reviewers. Comments will be addressed and submitted to OD. Test the effect of velocity and fluid volume on blood penetration
- Q2. Test the flammability of fabric materials
- Q3. Test the rigidity of respirators
- Q4. Test the effect of viscosity/surface tension

Applicable standards

- 42 CFR Part 84; FDA clearance
- ASTM Standards; OSHA blood borne pathogen standard

Key Partners

- CDC, FDA, ASTM, OSHA

Stakeholders

- Respirator manufacturers; Healthcare Professionals
- FDA, ASTM

Outputs (completed and/or planned)

- Published a paper on “Resistance to synthetic blood penetration---- respirators” in Am J Infect Cont 43:1190-1196 (2015)
- Published a paper on “A comparison of facemask and respirator filtration test methods” in (2017) J. Occup. Environ. Hyg 14: 92-103
- FDA/NIOSH Inter Agency Agreement in process

Outcomes (completed and/or planned)

- Citation in scientific literature
- Incorporation of findings into new or existing standards (ASTM F23) and government (e.g. FDA, CDC and OSHA) and non-government organizations (IAB, WHO, and MSF) that make recommendations and selection guidance for healthcare workers
- ASTM F23 committee will use research findings to improve the ASTM F1862 test method
- CDC will update/validate PPE recommendations for use during public health emergency situations