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Director
National Institute for Occupational Safety and Health
Centers for Disease Control and Prevention
Department of Health and Human Services

AIHA Comments on the Need to Establish Personal Protective Technology Centers of Excellence to Address Research and Practice Gaps

Agency/Docket Numbers:
Docket Number CDC-2021-0115
NIOSH-343

Dear Director Howard:

AIHA, the association for scientists and professionals committed to preserving and ensuring occupational and environmental health and safety (OEHS), appreciates the opportunity to provide feedback on NIOSH’s request for information (RFI) on the need to establish centers of excellence to address research and practice needs in the area of personal protective technology (PPT), including personal protective equipment (PPE). Below is our feedback on the questions posed in the RFI; we hope you find our comments helpful.

(1) What are the perceived needs for and benefits of establishing centers of excellence to advance PPT research and practice as it relates to your organization or for you personally?

Building databases to allow for easier selection of appropriate PPT based on the potential hazards are among the primary needs and benefits of a centers of excellence focused on PPT.

Better dissemination of information to the general public and OEHS professionals on data and research findings, which are not currently well covered, should be done in a simple, understandable way. Although the mission of the National Personal Protective Technology Laboratory (NPPTL) is “specifically dedicated to generating new knowledge in the field of occupational safety and health and to transferring that knowledge into practice for the
betterment of workers”,¹ often this transfer of knowledge is lacking, and people generally do not know where to go for immediate information for specific questions or issues involving PPT. Much vital information is not well disseminated or interpreted by the NPPTL using easily understood language. For example:

- What are the different types of respirators, including their benefits and liabilities for real-world work situations?
- What is the difference between PPT in respirators and the source control of cloth/surgical masks?
- What type of hazard assessment must be performed to determine proper flame resistant or flame retardant clothing?

(2) Are there specific PPT research and practice needs for certain industry sectors and/or occupations?

For electrical work and contact with high voltage power lines, a tracking arc can cause ignition of worker undergarments in certain circumstances. However, there is no research, data, or information from the NPPTL on when flame-resistant undergarments are needed for protection. What are the reasons why a full-face respirator, which can provide the best personal protection against airborne aerosols, is not worn by dental personnel? And, if having a non-return valve is the problem, what filtering mechanism could be used to make a full-face respirator available for dental and emergency room personnel?

(3) Are there specific PPT research and practice needs for different types of hazards (e.g., biological, chemical, gas and vapor, thermal, physical)?

Research is lacking in electric arc (arc flash) conditions. What are the noise levels during an electrical arc? What are “blast” pressures for an electric arc, and what PPE, if any, is required for these blast situations?

Another PPT research need is better methods of determining overheating problems when wearing full PPT in different environments (e.g., forest firefighters, Level 2 protection for emergency response teams, chemical protective clothing) and work/rest schedules for these environments.

(4) Are there specific PPT research and practice needs for certain anatomical categories of protection (e.g., dermal, vision, hearing, respiratory)?

Information readily available regarding hearing protective devices is deficient for fitting these devices and when different types of hearing protective devices are needed. Perhaps a separate section for each anatomical protective device is needed for incorporation into the centers of excellence?

¹ https://www.cdc.gov/niosh/npptl/about.html
(5) Which particular academic disciplines, research domains, or technical expertise should contribute to addressing PPT research and practice needs? Describe multi- or inter-disciplinary needs to most effectively advance research and practice.

A multi-discipline approach is most desirable. Team members should include those who are experienced and knowledgeable in human anatomy and physiology, physics, OEHS, occupational health nursing, and ergonomics, and others for special situations, such as audiologists for hearing protection. Academic programs in PPT are also lacking. There are very few, if any, university instruction programs specific to PPT. Greater emphasis should be placed on providing incentives for universities and colleges to hire and train persons in the science and art of PPT. Degrees in industrial hygiene, for example, could include PPT as a subspecialty.

(6) Describe emerging or novel technologies that can be investigated with respect to increasing the effectiveness of PPT.

End of life indicators and the use of technology to indicate PPT replacement or failure are both examples of emerging or novel technologies that can be investigated.

The most emerging technologies were noted already by NIOSH: sensors. This list should also include artificial intelligence and technologies for the end-of-service life of respirator cartridges and their facepieces. PPE as an ensemble includes a systems approach for selection. For example, the systems approach would include all of the PPE worn as one “system”. Testing could be done for PPE systems instead of for individual components.

Defining better use of PPT regarding using respirators in a high-risk environment for chemical exposure is another area of needed focus. For instance, in one AIHA member’s experience, they had personnel using half-face respirators with goggles, clothed with chemical protective clothing, and double gloves. If the goggles fogged up, the employee needed to move out of the hazard area, de-glove the double gloves, then clear the fogged splash goggles, re-glove, and return to work. They found that a better solution is to use powered air purifying respirators, which provided better protection without the interruptions. However, this information hasn’t been disseminated out of their company to the workers in other companies and industries. The use of goggles with half-face respirators was cost-driven, without looking at the cost of down-time from goggle fogging (a PPE equipment failure).

(7) How well do the three broad focus areas described above identify critical needs? Are there alternate or additional needs that have not been identified in this notice?

One possible sub-core or specialty PPE is for fire service and its associated PPT and PPT for other special conditions and needs such as wildfires and search and rescue, or law enforcement.
It bears emphasizing that many companies look at the cost of PPT without looking at total costs.

(8) NIOSH anticipates that future PPT centers of excellence will include at least three functional core areas: planning and evaluation, which includes center of excellence administration; research, which can be comprised of pilot projects, small projects, and large projects; and outreach, which can include communication and dissemination activities, education activities, and implementation activities. An academic training functional core area is optional. How important are the different core areas and activities within core areas to the ability of centers of excellence to advance PPT research and practice?

The academic training core area should not be an option but included as a component with the additional other functional areas, or included and specified with the “education and academic activities”. Also please consider sub-core areas for special industries and needs.

Conclusion and next steps
AIHA thanks you for the opportunity to provide feedback on this RFI and looks forward to working with NIOSH to help protect all workers by advancing research, knowledge, and practice. If you have any questions on these comments or other matters, please contact Mark Ames at mames@aiha.org or (703) 846-0730.

Sincerely,

Lawrence Sloan, MBA, FASAE, CAE
Chief Executive Officer
AIHA

About AIHA
AIHA is the association for scientists and professionals committed to preserving and ensuring occupational and environmental health and safety in the workplace and community. Founded in 1939, we support our members with our expertise, networks, comprehensive education programs, and other products and services that help them maintain the highest professional and competency standards. More than half of AIHA’s nearly 8,500 members are Certified Industrial Hygienists and many hold other professional designations. AIHA serves as a resource for those employed across the public and private sectors as well as to the communities in which they work. For more information, please visit www.aiha.org.