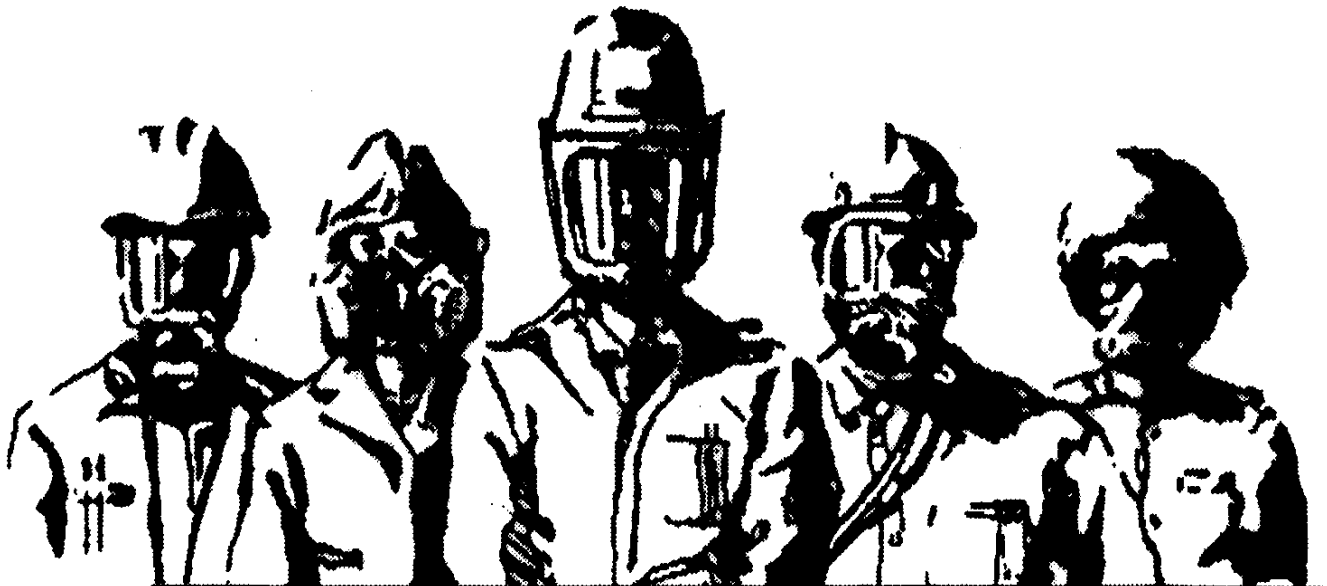




Journal of the International Society for Respiratory Protection

Vol. 33, No. 1, 2016

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Respirator Use in a Hospital Setting: Establishing Surveillance Metrics

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ABSTRACT

Information that details use and supply of respirators in acute care hospitals is vital to prevent disease transmission, assure the safety of health care personnel, and inform national guidelines and regulations.

Objective: To develop measures of respirator use and supply in the acute care hospital setting to aid evaluation of respirator programs, allow benchmarking among hospitals, and serve as a foundation for national surveillance to enhance effective Personal Protective Equipment (PPE) use and management.

Methods: We identified existing regulations and guidelines that govern respirator use and supply at Vanderbilt University Medical Center (VUMC). Related routine and emergency hospital practices were documented through an investigation of hospital administrative policies, protocols, and programs. Respirator dependent practices were categorized based on hospital workflow: Prevention (preparation), patient care (response), and infection surveillance (outcomes). Associated data in information systems were extracted and their quality evaluated. Finally, measures representing major factors and components of respirator use and supply were developed.

Results: Various directives affecting multiple stakeholders govern respirator use and supply in hospitals. Forty-seven primary and secondary measures representing factors of respirator use and supply in the acute care hospital setting were derived from existing information systems associated with the implementation of these directives.

Conclusion: Adequate PPE supply and effective use that limit disease transmission and protect health care personnel are dependent on multiple factors associated with routine and emergency hospital practices. We developed forty-seven measures that may serve as the basis for a national PPE surveillance system, beginning with standardized measures of respirator use and supply for collection across different hospital types, sizes, and locations to inform hospitals, government agencies, manufacturers, and distributors. Despite involvement of multiple hospital stakeholders, regulatory guidance prescribes workplace practices that are likely to result in similar workflows across hospitals. Future work will explore the feasibility of implementing the collection and reporting of standardized measures in multiple facilities.

Keywords: Respirator use and supply, Personal Protective Equipment, Hospital settings, PPE Surveillance System.

ISRP members can read the full paper in the members-only section.

Characteristics of Korean Children's Facial Anthropometry Evaluated by Three-dimensional Imaging

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ABSTRACT

There are few commercial respirators designed specifically for children because no three-dimensional anthropometric data exist for children's faces. As a first step, facial anthropometric dimensions need to be analyzed using a three-dimensional image capture device that can measure many dimensions accurately and easily in a short time. The aim of this study was to characterize the facial dimensions of Korean children using three-dimensional imaging for use in respirator design. Faces of children (n = 144, aged 5–13 years) were analyzed with three-dimensional imaging. We utilized Geomagic Capture, Geomagic Wrap, and Design X software (3D SYSTEMS, USA). Cluster analysis was performed for 16 facial dimensions to categorize them into different sizes. The geometric means were used to divide the groups using the K-means algorithm. Facial shapes were classified into three clusters: small, medium, and large. The face width and length for the first group were small with high protrusion of nose, while the face width and length for the second group were larger than those in the first and third groups. The facial dimensions for the third group showed medium dimensions but had the largest angle of the nose root to the gnathion (n-prn-gn). Children's facial dimensions increased with age, but not equally in all dimensions. Three clusters of small, medium, and large respirators were designed according to children's facial dimensions. We are in the process of developing an optimal mask size for each cluster based on the three-dimensional facial characteristics. This study showed that three-dimensional imaging can be useful for obtaining reliable and reproducible facial data.

Keywords: Anthropometric analysis, three-dimensional imaging, Child facial dimensions, Respirator design.

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Effective Partnership is an underpinning of ANSI/ASSE Z88.2–2015 Practices for Respiratory Protection

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ABSTRACT

In the U.S., respiratory protection is broadly supported by a system of coordinated efforts among governmental organizations, professional associations, researchers, industrial hygienists, manufacturers, and others who produce knowledge, best practice guidance, standards, regulations, technologies, and products to assure workers can be effectively protected. Ultimately, the work of these partners is applied by employers in establishing and implementing an effective ANSI/ASSE Z88.2–2015 conforming respirator program. This article describes key partners and their activities and/or responsibilities to assure an effective respirator program.

Keywords: Respiratory protection, Respirator program, Z88.2 standards.

ISRP members can read the full paper in the members-only section.