Letters to the Editor

New ASTM Barrier Test Methods

To the Editor:

Since the emergence of the era of the human immunodeficiency virus (HIV) and the implementation of the principles of Universal Precautions, the Infection Control Practitioner's (ICP) role in selecting items described in the OSHA Standard' as being "appropriate" for use as personal protective equipment has been perplexing.[2]

For example, during this period, several clinical researchers[3-5] have published the results of their examination of an array of commercially available materials used in surgical gowns. Actually, their findings simply confirmed those of another researcher,[6] who some two decades earlier, had disclosed that all the materials displayed varying degrees of barrier capabilities.

In one of the more recent studies,[5] the researchers reported on the liquid penetration experienced during their classic in-use evaluation of an assortment of surgical gowns. Based on their findings, the group concluded that since every member of the surgical team did not have the same degree of exposure, they did not require the same level of protection. This being the case, it would be reasonable to believe that a materials protective capability should be expressed in terms of its level of resistance to liquid penetration. By rating the materials in this manner, the ICP would be able to select the quality considered appropriate for the risk involved.

Nevertheless, a new industry group functioning under the auspices of the American Society for Testing Materials (ASTM) recently has released two new emergency test methods, ES 21 and ES 22, to be used in assessing a material's barrier effectiveness.[7] Despite the fact that the documents reference two clinical studies[4,8] that indicate that pressures experienced during use could be as high as 60 pounds per square inch (psi), the material's barrier capability is expressed on a pass/fail basis with its suitability for use predicated on an arbitrarily selected level of pressure of 2 psi.

Disregarding the particulars of the test methodologies themselves, the fact of the matter is that basing the selection of an appropriate item on this pass/fail criterion easily could be misinterpreted by the wearer and translated into a false sense of security in terms of the level of protection the material is capable of providing under its "usual conditions of use."[9] In addition to restricting the user's ability to identify materials capable of resisting liquid penetration at levels of pressure higher than 2 psi, using a level of 2 psi as a basis for pass/fail could similarly exclude the use of many products that have been and are currently being used since the community considers them adequate for providing the level of protection required for the task at hand.[10]

Furthermore, in times in which the community is experiencing intensive cost restraints, providing all personnel with what the industry group considers to be the maximum level of protection could not be regarded as being cost-effective. In addition, it would not be in accord with the intent of the OSHA Standard[1] that the level of protection should be commensurate with the degree of exposure that is reasonably anticipated.

Inasmuch as the ASTM tests are being publicized by the developer and are being used commercially as a point of reference by manufacturers in promoting their fabric and/or gown, it is important that the ICP be aware of their implications so as not to be influenced unduly in making an informed, intelligent purchasing decision.[11,12]

Only time will tell whether or not industry will ever be able to produce a gown that is "totally safe (by using thick polyethylene) and do so without compromising either comfort or cost."[13]

Without doubt, the world has been made a different place by the emergence of human immunodeficiency virus. In terms of barrier technology and protective apparel, the textile industry should continue

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to dedicate its efforts to respond to the best of its ability to the needs and demands of the healthcare community it serves. However, it is only the healthcare community that should be determining the level of performance they expect that technology to provide.

In the interim, it appears that it would be proper for industry to adopt one of the simple and inexpensive test methodologies described in the clinical literature[4,6,14] for the screening of materials. These data could then be submitted for the ICP's use in assessing the protective attributes of the state-of-the-art materials as well as the gowns design, construction, and cost.

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Guaiac Testing of IV Lines

To the Editor:

The article by Manian et al (1993;14:325-330) regarding the risk of transmission of bloodborne illness through needles removed from IV ports was timely and important to the management of this common occurrence.

One point that the authors did not raise involves the possibility that guaiac testing may not always detect the presence of blood. Although I do not know enough about the physics of the fluids involved to predict this with any accuracy, it would seem likely that a certain amount of sedimentation might occur naturally at the end of an IV line. If this is so, the lighter elements of the serum may be found considerably higher in the line than red cells, and the risk of infection might be significantly higher than predicted in this article.

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The authors reply:

We appreciate Ms. Patrick's interest in our article. We do not believe sedimentation of blood in IV tubings confounds the results of our study, for several reasons.

First, it should be remembered that all needles in our study were removed from IV lines immediately after the administration of IV medications. Thus, any preexisting serum in the upper half of the IV line would not have remained undisturbed and instead would have been mixed with the red blood cells during the process of insertion and removal of the needle, and perhaps more importantly during the administration of medication.

Second, except for the heparin-locks, the tip of the needles removed from IV ports often were near the junction of the port and the main running line, and area that would not be conducive to undisturbed sedimentation of red blood cells.

Third, since some degree of hemolysis is inevitable in IV lines, even if there were significant sedimentation of blood, guaiac testing still would have detected extracorpuscular hemoglobin in the serum at the threshold level reported in the study.

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Port-a-Cath Needlestick Injuries

To the Editor:

Needlestick injuries are the major hazard for healthcare workers for acquiring human immunodeficiency virus (HIV) infection during their work.[1] Surveillance for needlestick accidents and study of the circumstances of such accidents are of critical importance when proposing preventive measures.

Recently, in our acquired immunodeficiency syndrome care center, two needlestick injuries occurred while removing needles from Port-a-Cath systems. These Port-a-Cath systems were used to administer intravenous foscarnet/gancyclovir treatment