The Evolution of a Fast Fit Test Protocol

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TSI has been working on the development and approval of a faster method of quantitative fit testing using the PortaCount® Respirator Fit Tester. The faster method has a reduced number of exercises to reduce overall test time. With less exercises, it is important to select the most rigorous exercises to identify poor-fitting respirators. Previous work has shown that head up-and-down, talking and bending were the most rigorous exercises, with talking on average showing the lowest fit factor. An analysis was performed on data from earlier TSI-sponsored studies. This analysis showed that the talking exercise frequently resulted in the lowest fit factor within each fit test when all fit tests were grouped together, but when only the poor-fitting respirators were in the group, the talking exercise was rarely the lowest. Conversely, the talking exercise was frequently the lowest when only good-fitting respirators were grouped. The data group for poor-fitting respirators is of primary interest because we are attempting to identify the exercises that are the best for challenging the face seal and identifying poor fitting respirators. The analysis showed that head up-and –down, bending, and head side-to-side were the exercises that were most likely to cause a failed fit test. An initial faster fit test method was developed and a pilot study performed. Data from the pilot study was used to develop new quantitative fit test protocols for elastomeric full- and half-facepiece, and filtering facepiece respirators.

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